

Ecotourism and Ecological Restoration in Union Island, Saint Vincent and the
Grenadines

By

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Abstract:

Ashton Lagoon, located in St. Vincent and the Grenadines, is examined as a case study, where an abandoned marina development left significant changes to the marine and coastal environment. For over 20 years, the lagoon has been left in this state, until the proposal for its restoration was approved and initiated in 2015. Part of the Ashton Lagoon Restoration Project involves introducing ecotourism as a means of sustainable livelihood development. Residents of Union Island were interviewed to reveal local perception of ecotourism's ability to contribute to ecological restoration projects and community capital. The relationship between tourism and forms of capital (*natural, economic, human, physical, social, and cultural*) is described, and barriers to ecotourism development and management options are identified.

Keywords: ecotourism; sustainable tourism; ecological restoration; Small Island Developing States; sustainable development; community capital; Grenadines

List of Abbreviations

ALRP – Ashton Lagoon Restoration Project
BPOA – Barbados Program of Action
CARICOM – Caribbean Community
CCF – Community Capital Framework
ECCEA – Eastern Caribbean Coalition for Environmental Awareness
EIA – Environmental Impact Assessment
FDI – Foreign Direct Investment
GoSVG – Government of St. Vincent and the Grenadines
IUCN – International Union for Conservation of Nature
MAPERSC – Marine Affairs Program Ethics Review Standing Committee
NGO – Non-Governmental Organization
NMBCA – Neotropical Migratory Bird Conservation Act
OAS – Organization of American States
ODA – Official Development Assistance
OECS – Organization of Eastern Caribbean States
P3DM – Participatory 3-Dimensional Mapping
SIDS – Small Island Developing States
SusGren – Sustainable Grenadines Inc.
TCMP – Tobago Cays Marine Park
TIES – The International Ecotourism Society
UIEA – Union Island Environmental Attackers
UPMCA – Union-Palm Island Marine Conservation Area
WTTC – World Travel & Tourism Council

Chapter 1: Introduction

1.1. Management Problem and Rationale

St. Vincent and the Grenadines (SVG) is a southeastern Caribbean state part of a group of Small Island Developing States (SIDS). SIDS are a group of nations that share sustainable development challenges beyond those faced by developing countries. Past and current environmental stresses in SVG include agriculture, fishing, and tourism industries; however, the smaller Grenadine Islands rely on tourism as the main source of income (Mills, 2001). Union Island is the southernmost inhabited island in the Grenadine Island chain, and has an established tourism sector that is primarily based on yachters. Union Island is surrounded by sensitive habitats such as coral reefs, mangroves, and seagrass beds which provide immeasurable ecosystem services and serve as the basis for tourism and other industries (Mills, 2001). The Eastern Caribbean Coalition for Environmental Awareness (ECCEA) aims to provide alternatives to mass tourism in the Caribbean to focus on natural and cultural assets, communities and partnerships. ECCEA recognizes ecotourism as a growing form of sustainable tourism that can improve island conservation through community-based nature and heritage tourism, and education (ECCEA, 2018).

As a form of sustainable tourism, ecotourism should act as a tool for realizing sustainable development. By definition, ecotourism involves four central tenets: responsible travel to natural areas, conservation of the environment, promotion of the welfare of local people, and the incorporation of education and interpretation (Whelan, 2013). While these tenets are often upheld, poor management practices in some areas have resulted in unsustainable activities being referred to as ecotourism (Horton, 2009; Lamb et al., 2014). If ecotourism is not developed with the SDGs at its foundation, it may fail to fulfill the expectations of communities it is meant to support.

Sustainable Grenadines Inc. (SusGren)—a Grenadines-based non-governmental organization (NGO), is conducting ecological restoration in Ashton Lagoon on Union Island, SVG following a failed marina development. Part of the restoration project involves introducing ecotourism activities as a means of developing environmentally sustainable livelihoods and generating an economic interest in the wellbeing of marine and coastal ecosystems within the

community. This study aims to gather local perceptions of the potential impacts of ecotourism at a site undergoing ecological restoration.

1.2. Tourism in Small Island Developing States

SIDS face inherent challenges such as a narrow economic base and high vulnerability to external shocks and natural disasters (SVG-MFEP, 2013). SIDS in the Caribbean have a long history of specializing in primary commodity exports, and being described as “producing what they do not consume, and consuming what they do not produce” (Pantin, 1999, pp. 221). Developing countries with significant access to natural capital are increasingly looking to develop their economies in more sustainable ways, replacing extractive industries. Tourism is one of the fastest growing industries worldwide, and many Caribbean SIDS with limited options for development have suitable environments for hosting a successful tourism sector (UNWTO, n.d.). Although tourism is not necessarily the complete answer to development, it is often adopted due to a lack of perceived alternatives (Bishop, 2010). As a typically non-extractive and potentially sustainable sector, tourism has had a significant influence on economic growth over the last 20 years in SIDS, many of which have benefitted economically, but also become very dependent on the sector (Roudi et al., 2018). Tourism arrivals in SIDS are largely influenced by biodiversity levels, indicating that biodiversity richness and economic wellbeing from tourism are to an extent, co-dependent (Teelucksingh & Watson, 2013). However, evidence suggesting that tourism can negatively impact biodiversity can create a paradox for SIDS that have tourism-dependent economies (Teelucksingh & Watson, 2013).

Common challenges of SIDS in regard to the tourism sector include limited connectivity, fragile natural environments, vulnerability to damage caused by climate change, financial leakages, and limited community engagement (UNWTO, 2014). There may also be a great difference between the expectations of international tourists and supply capacity of the local communities, and what a local business needs or is capable of offering (Barrowclough, 2007). Since the tourism sector in SIDS is often faced with inadequate domestic capital, foreign direct investment (FDI) can be useful for transferring capital such as skills, managerial and organizational practices, and technology to develop and create access to markets, in addition to economic growth in destination countries (Roudi et al., 2018). Developing countries have been increasingly open to attracting FDI, yet not all have the policies in place that will help them

maximize benefits and minimize costs, and many SIDS have struggled to attract FDI (Barrowclough, 2007; SVG-MHWE, 2013).

1.3. The Sustainable Development Goals and Tourism

As one of the fastest growing economic sectors worldwide, tourism can often create challenges relating to carbon emissions, economic leakages, resource management, and impacts on local communities and cultures, highlighting the importance for its sustainable development (WTO-UNDP, 2017). The 2030 Agenda for Sustainable Development—an action plan building on decades of work by the United Nations (UN), that highlights global challenges to sustainable development—was ratified by UN member states in 2015, at the core of which is the 17 Sustainable Development Goals (SDGs) (Fig. 1) (Scheyvens, 2018).

Tourism is gaining increasing recognition as a potential driver and accelerator of the SDGs because of its ‘crosscutting and multiplying’ effect on other sectors and industries, such that 2017 was designated as the International Year for Sustainable Tourism for Development by the United Nations General Assembly (WTO-UNDP, 2017). The tourism sector can be directly or indirectly related to all 17 SDGs, however SDG 8, 12 and 17 appear to have the strongest link (WTO-UNDP, 2017). The promotion of sustainable tourism is embedded in these goals, with specific mention of increasing benefits to SIDS (Goal 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development). *Figure 1* outlines an analysis of opportunities, challenges and threats from tourism in relation to the SDGs (WTO-UNDP, 2017).

Furthermore, the promotion of ecological restoration of both marine and terrestrial habitats and the systems they support is included in three of the SDGs (Goal 14 –above; Goal 6 – Ensure availability and sustainable management of water and sanitation for all; and Goal 15 – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

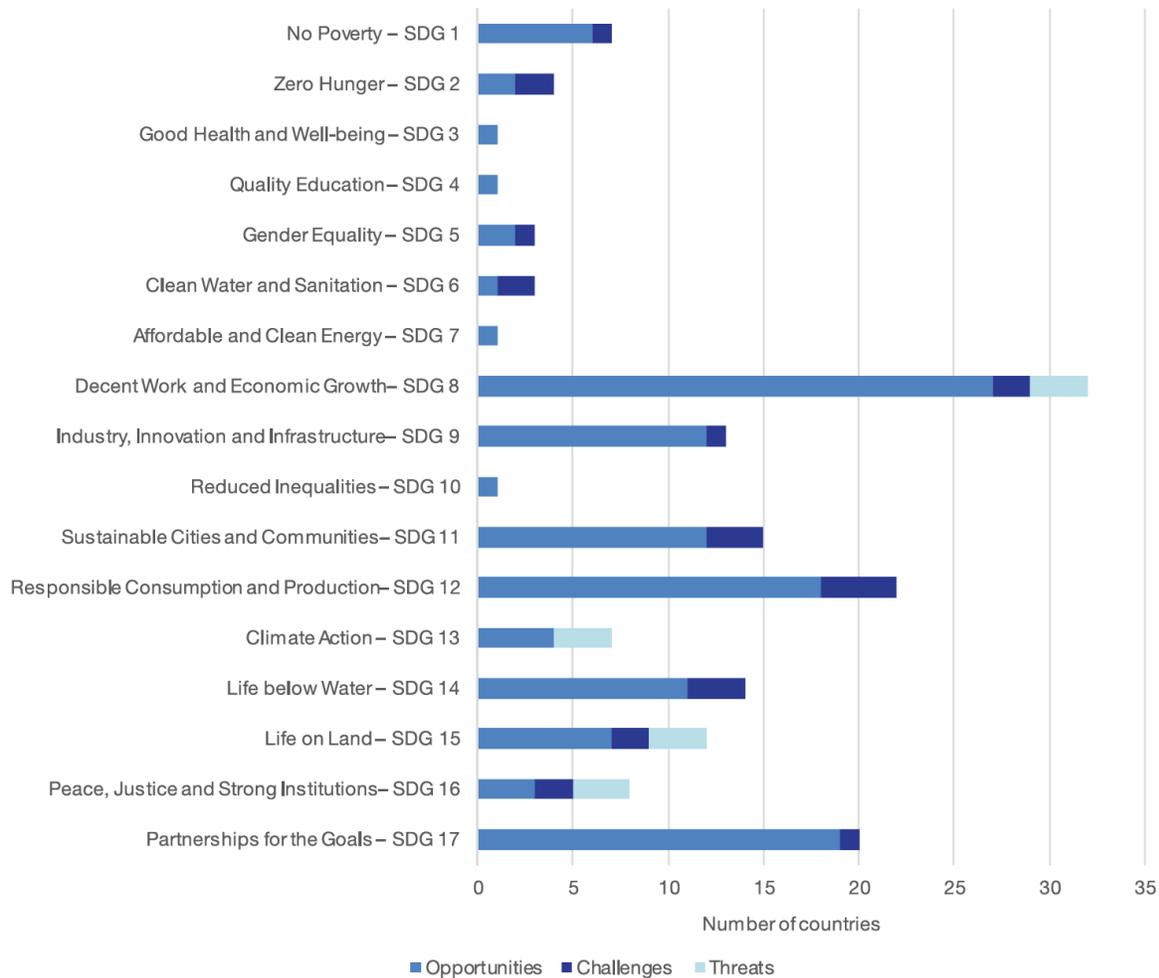


Figure 1. Results of 41 Voluntary National Reviews reveal the reported opportunities, challenges and threats of tourism in relation to each of the Sustainable Development Goals (SDGs). SDG 8 shows the strongest link to tourism, due to reported provision of decent work, specifically for women and youth (WTO-UNDP, 2017).

1.4. Ecological Restoration

The Society for Ecological Restoration defines ecological restoration as “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” (SER, 2004, pp. 3). This process includes eliminating or reducing potential threats to the health and integrity of the ecosystem (SER, 2004). An area may be restored for reasons such as the protection or recovery of an individual species, improving ecosystem function or connectivity, or improving visitor experience (Keenleyside et al., 2012). Thousands of ecological restoration projects are implemented annually, the cost varying with the type and size of ecosystem, the

level of degradation, the demand for results, and other specific conditions (Gradinaru, 2014). The ecosystems present in Ashton Lagoon—coral reefs, mangroves, and other marine ecosystems, are typically considered the costliest ecosystem types to restore (Gradinaru, 2014). Restoration planning should include a clear rationale, goals and objectives, a description of the reference ecosystem, wider landscape integration, performance standards and monitoring protocols by which to evaluate the program, and strategies for long-term maintenance (SER, 2004). An ecosystem can be considered ‘restored’ when it is self-sustaining to the same degree as its reference ecosystem, and abiotic and biotic elements are able to continue development without assistance, demonstrating resilience (the ability of a community or ecosystem to return to its regularly functioning state) to normal environmental stress and disturbance (SER, 2004).

From an economic perspective, restoration of natural capital can be regarded as an investment in ecological infrastructure (Gradinaru, 2014). The restoration of natural capital can include activities like the following: restoration of terrestrial and aquatic ecosystems; restoration of ecological processes to improve soil fertility; improving methods of natural resource exploitation; or the creation of activities and behaviours that incorporate knowledge, awareness, and sustainable management (Gradinaru, 2014). Restoration projects can therefore contribute to climate change mitigation and adaptation by strengthening resilience, providing ecosystem services, and sequestering carbon (Keenleyside et al., 2012). Hobbs and Harris (2001) argue that restoration ecology should be integrated into adaptive land management, recognizing that ecosystems are dynamic, and combine science, practice, and policy.

1.5. Research Questions

How can ecotourism at ecological restoration sites contribute to sustainable community development in Caribbean Small Island Developing States?

- How can ecological restoration and ecotourism development interact for mutual success?
- How is ecotourism development on Union Island perceived to impact *natural, physical, economic, human, social, and cultural* capitals?

Chapter 2: Research Methodology

2.1. The Community Capital Framework

The Community Capital Framework (CCF) builds on existing sustainable development frameworks such as the Triple Bottom Line, which is a widely-used accounting framework that incorporates social, environmental, and economic dimensions to measure an organization's impact on the world (Slaper & Hall, 2011). The CCF considers six forms of capital which, when strengthened, form the foundation for sustainable community development (Table 1) (Roseland, 2012). An online tool was developed to quantify aspects of this framework (SFU, 2012), however this study uses the CCF as a conceptual framework and guide for formulating the interview guide (Appendix A). Roseland (2012) outlines a list of indicators or 'stocks' for each form of capital, which have certain requirements that can vary with location. Interview questions were based on the stocks and corresponding fulfilment requirements which were relevant to tourism on Union Island.

Table 1. The six forms of community capital—or local assets, as described by Roseland (2012).

<i>Natural Capital</i>	Refers to non-renewable and renewable natural assets that yield flow of natural goods and services into the future.
<i>Economic Capital</i>	Refers to allocation of resources and how decisions are made about material lives; is essential for building a stable economy.
<i>Human Capital</i>	Refers to attributes such as knowledge and skills held by individuals that facilitates wellbeing and contributes to labour productivity.
<i>Physical Capital</i>	Refers to the infrastructure that supports basic needs, such as shelter, access to clean water, unspoiled food, and energy.
<i>Social Capital</i>	Refers to community aspects such as relationships, networks, norms, cohesion, reciprocity, commonly accepted standards; diverse meaning.
<i>Cultural Capital</i>	Refers to the product of shared experience through traditions, customs, values, heritage, identity and history.

2.2. Semi-Structured Interviews

Employees of SusGren were asked to identify key individuals involved in the development progress of Ashton Lagoon, as well as those who use or plan to use the area for income. This study is not intended to be a comprehensive stakeholder assessment of the

development of ecotourism in Ashton Lagoon, but rather an attempt to illuminate the potential impacts of ecotourism on livelihood assets as perceived by Union Island residents. Semi-structured interviews were chosen to allow topics and concerns related to the interview questions to be raised by participants.

Interviews were conducted on Union Island, SVG in August of 2018 (MAPERSC #07; Appendix B). At the end of the interview, participants were asked to identify other potential respondents (Goodman, 1961). Ten residents were contacted for interviews, one of which did not acknowledge the request, and two of whom were unavailable. For the seven persons who participated in this research, interviews took place in person and ranged in length from 48 minutes to 2 hours and 28 minutes. Interviews were transcribed verbatim for analysis. Responses were then summarized and categorized by form of capital. Therefore, the results section (Chapter 6) is a summary of local opinion. As this study focuses on perception, there is no measurement of accuracy in these results, however they are opinions of citizens and should therefore be considered. Each participant had been living on Union Island for at least 10 years, and either personally used or intended to use Ashton Lagoon as a source of income, or have been involved with the process of events taking place in Ashton Lagoon.

2.3. Market Research Survey

A supplemental survey was created using Google Forms, that aimed to determine which ecotourism activities are preferred among tourists to Union Island. Respondents were asked to elaborate on details of their visits, specific preferences associated with their experiences, and willingness to pay. The full survey can be found in Appendix C. The survey was shared on SusGren's social media pages (Facebook, Instagram, and Twitter) on July 17, 2018, and remained active until the end of August 2018, with two subsequent re-posts on Facebook, and targeted past, regular, and anticipated tourists to Union Island. Surveys were not distributed in person due to the low number of tourists on the island during low season. Local tourism businesses were contacted and asked to distribute the survey on their social medias. It was then shared on 20 different Facebook pages, most of which were personal profiles, only one of which was a local business (Anchorage Yacht Club), and on one community group page (Birds of the Transboundary Grenadines). A total of 28 respondents completed the survey, ranging in age

from 20 to 67, from North America, Europe, and the Caribbean. The results of this survey are presented in Appendix D.

2.4. Limitations of the Research

The researcher's position as an intern with SusGren at the time of data collection may have resulted in partial biases. Since SusGren is executing the ALRP, participants may have felt inclined to provide more 'eco-friendly' responses, although confidentiality and objectivity as a researcher were made explicitly clear. Furthermore, since SusGren staff were used to initially identify participants, it may have led to unintentional exclusion of suitable participants who have not worked with SusGren, and of whom SusGren is unaware. Furthermore, the study took place in the low season, when many residents leave the island, resulting in a lower number of participants to be interviewed as well as limited opportunity to distribute the market research survey.

Ecotourism and infrastructure in Ashton Lagoon are still in the developmental phase, meaning that participants' opinions of its development are prophetic. Therefore, this study analyzes the perceived potential that ecotourism activities can contribute to community capital, rather than experienced impacts.

Chapter 3: Case Study Area

3.1. Saint Vincent and the Grenadines (SVG) and the Grenadine Bank

Located in the Lesser Antilles island chain, the Grenadine Bank consists of more than 20 islands belonging to the nations of SVG and Grenada (Fig. 2). Nine have permanent settlements, including a private island (Mustique), two resort islands (Palm Island and Petit St. Vincent) and six that have communities with supporting public and private infrastructure (Bequia, Canouan, Mayreau, Union Island, Petite Martinique and Carriacou) (Mahon et al., 2004). SVG is comprised of the main island of Saint Vincent, and the northern two thirds of the Grenadines—Bequia, Mustique, Canouan, Mayreau, Union Island, Palm Island, Petit St. Vincent, and 28 uninhabited islets (SVG-DMA, 2013). As of 2002, more than 90% of SVG’s population of approximately 100,000 lived on mainland St. Vincent (SVG-DMA, 2013). Smaller populations throughout the Grenadine islands maintain strong historical linkages—the international border rarely impacting fishing, informal trade, tourism, and social life (Mahon et al., 2004).

Despite the small domestic markets, limited natural and human resources, declining official development assistance, restrictive international markets, and the unpredictable effects of climate change creating a sluggish economic environment, the Government of SVG (GoSVG) is still maintaining economic growth (SVG-MHWE, 2013). SVG’s economy used to be predominantly agriculture based, but has shifted to a service-oriented economy of which tourism is the most important economic activity (further described in Section 3.2) (SVG-DMA, 2013). Total contribution from travel and tourism to GDP was 23.4% of GDP in 2017, with the expectation to rise to 30.9% by 2028 (WTTC, 2018). The total contribution to employment from this sector was 21.5% of total jobs (includes jobs indirectly supported by travel and tourism), and is expected to grow to 29% by 2028 (WTTC, 2018). Visitor export and capital investment is also predicted to increase by over 5% per year (WTTC, 2018).

Tourism in SVG is predominantly in the Grenadine Islands, where it is mainly centered around sailing and water-based activities, while ecotourism and heritage activities are more common on mainland St. Vincent (SVG-EU, n.d.). Wetland protection and utilization are often in conflict in developing countries due to the push to accelerate economic development (Wang et al., 2008). SVG’s Marine Tourism Policy—which is currently being updated—states, “The [GoSVG] will encourage investment in marine based tourism by amending, where necessary, the

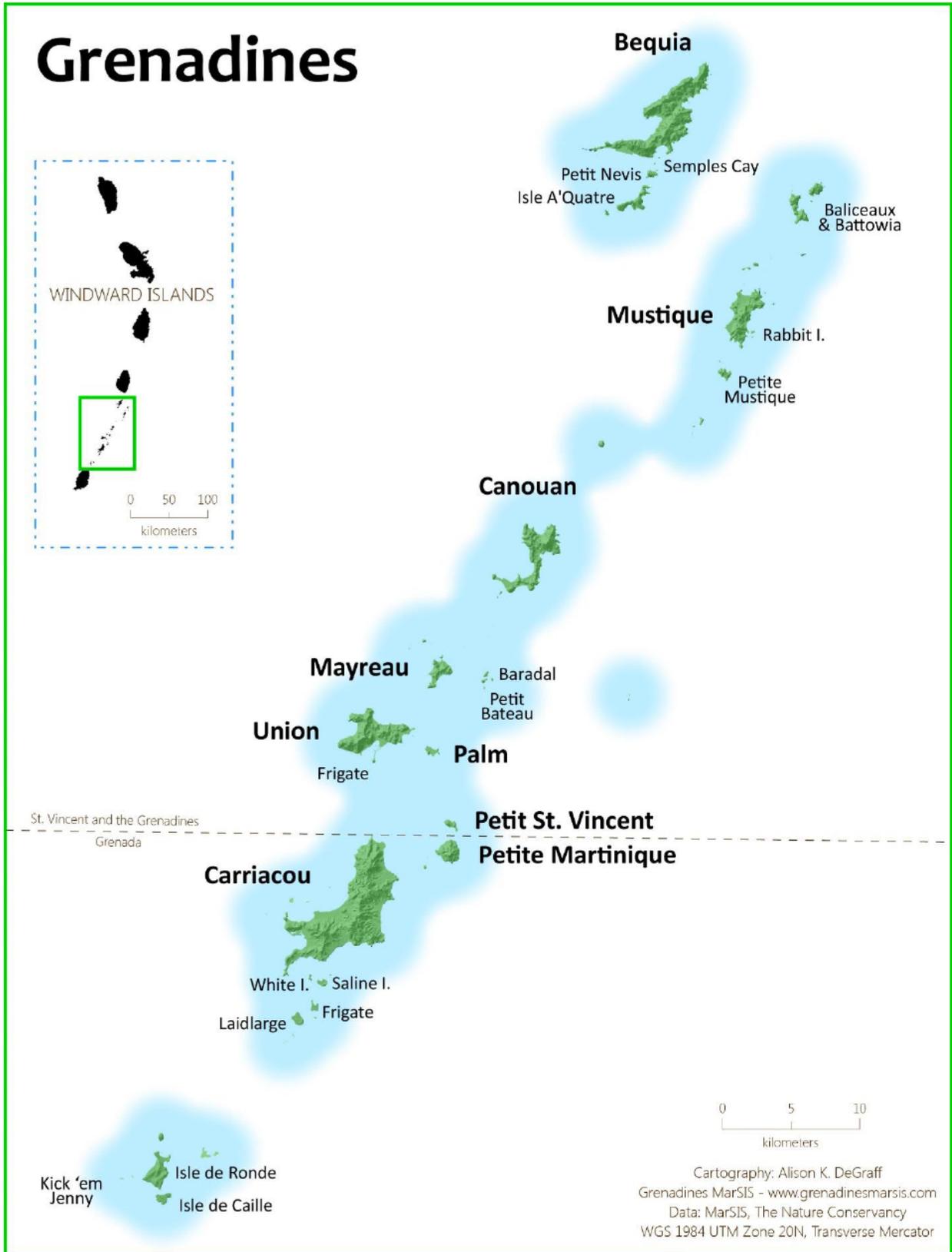


Figure 2. Map of the Grenadine Islands (DeGraff & Baldwin, 2013).

draft Tourism Incentives Act, Fisheries Act, Customs Act and other legislation which may be relevant” (SVG-EU, n.d., pp. 7). Lack of public awareness, insufficient funding for wetland protection and management, flawed legal systems, a lack of institutional coordination and research, and underdeveloped technology are among some of the challenges to wetland management faced by developing countries (Wang et al., 2008).

The Grenadine Bank hosts the most extensive coral reefs and related lagoon, seagrass, and mangrove habitats in the Eastern Caribbean, supporting the two major sources of employment in the area—tourism and fishing (Mahon et al., 2004). While tourism is a growing sector in the area, fishery resources have become subject to full or over-exploitation, limiting the sustainable growth of the fishing sector (Mahon et al., 2004). Overfishing, near shore habitat degradation, terrestrial de-vegetation, sedimentation, terrestrial and marine solid waste and sewage disposal, and the recreational abuse of coral reefs have been a result of unplanned and unregulated uses in the Grenadines, undermining the potential for sustainable economic growth (Mahon et al., 2004). Since tourism in SVG is heavily reliant on the marine environment, the quality—or how tourists perceive the quality of the marine environment can have a significant impact on the value of this sector (SVG-DMA, 2013).

SVG is an active member of both the Caribbean Community (CARICOM) and the Organization of Eastern Caribbean States (OECS), and has embraced the principles of Agenda 21 (United Nations action plan regarding sustainable development) as well as the 14-point program of the Barbados Program of Action (embodies sustainable development principles in Agenda 21, creating specific policies and actions) (SVG-MHWE, 2013). The protection and restoration of marine environments is listed as one of the main policy goals in SVG’s proposal for a National Ocean Policy (SVG-DMA, 2013).

3.2. Union Island

Union Island is the southernmost island of SVG that supports a community. The island is just under 8.3 square kilometers and hosts a fluctuating population of approximately 2500 individuals, mainly divided between the two towns of Clifton and Ashton (Fig. 3) (SVG-TA, 2009). The highest point in the Grenadines is Mount Taboi, at 304m, which is along Union Island’s chain of volcanic pinnacles (SVG-TA, 2009). Like the other islands of the Grenadines,

Union Island has dependency status and is under the administrative jurisdiction of St. Vincent (Adams, 1979).



Figure 3. Map of Union Island, St. Vincent and the Grenadines. Ashton Lagoon and Frigate Island are on the central south coast (DeGraff & Baldwin, 2013).

Unionites have traditionally emigrated to other places in search of work or turned to the marine industry because of unproductive agriculture and a lack of lucrative employment on Union (Adams, 1979). The island has in part maintained itself by “invisible exports”—payments and goods from relatives working abroad or on foreign ships (Adams, 1979). However, in the past Union Island used to be nearly self-sufficient—farming was prevalent (producing an abundance of corn, peas, cassava, potato, pumpkin, and okra) and was supplemented by some trading with South America (Phillimore, 2013). The land of Union Island today is dry and largely uncultivated—people depend on resources from overseas since there is little interest in going back to working the land when more money can be made from tourism (Phillimore, 2013). A development project in 1992 that compared income from different island communities,

revealed that Clifton, Union Island was far more dependent on tourism as a main source of income when compared to Canouan and Paget Farm, Bequia (Mahon et al., 2004).

3.3. History

3.3.1. Ecological Significance of Ashton Lagoon (adapted from Price & Price, 1994)

The Union Island/Palm Island Marine Conservation Area (UPMCA) was designated in 1986 under the Fisheries Protection Act. The UPMCA spans 1359.6 km² and encompasses the area between the southeastern shore of Union Island, including Ashton Lagoon and Frigate Island and the neighbouring Palm Island (Fig. 4) (UNEP-WCMC, 2018). Under the International Union for Conservation of Nature (IUCN) Protected Area Categories, the UPMCA is classed as a Category VI: Protected area with sustainable use of natural resources, which emphasizes the sustainable use of natural resources and the simultaneous protection of natural ecosystems (UNEP-WCMC, 2018; Dudley, 2008). Additionally, the Frigate Island Wildlife Reserve was designated under the Wildlife Protection Act of 1987 (SVG-NPRBA, n.d.). It is an IUCN Category IV: Habitat/Species Management Area, which aims to maintain, conserve, and restore species and habitats (UNEP-WCMC, 2018; Dudley, 2008).



Figure 4. The Union-Palm Island Marine Conservation Area (UPIMCA), designated under the 1986 Fisheries Protection Act of St. Vincent and the Grenadines (Protected Planet, 2018).

In the early 1990s, Ashton Lagoon was considered one of the few relatively pristine coastal lagoon ecosystems in the Lesser Antilles, and the last in the Vincentian Grenadines (Fig. 5a) (Price & Price, 1998). It contained the five principal components of a coastal lagoon and coral reef ecosystem: (1) There is a stretch of outer reefs that extend from Clifton Harbour to Frigate Island, that protects the (2) highly productive inner lagoon of warm and shallow water. (3) Large patches of seagrass beds filled the lagoon, and (4) a salt pond and (5) mangroves line the shore. Ashton Lagoon hosts the largest stock of mangrove in the Vincentian Grenadines (Phillimore, 2013). This habitat is an important nursery for commercially valuable species such

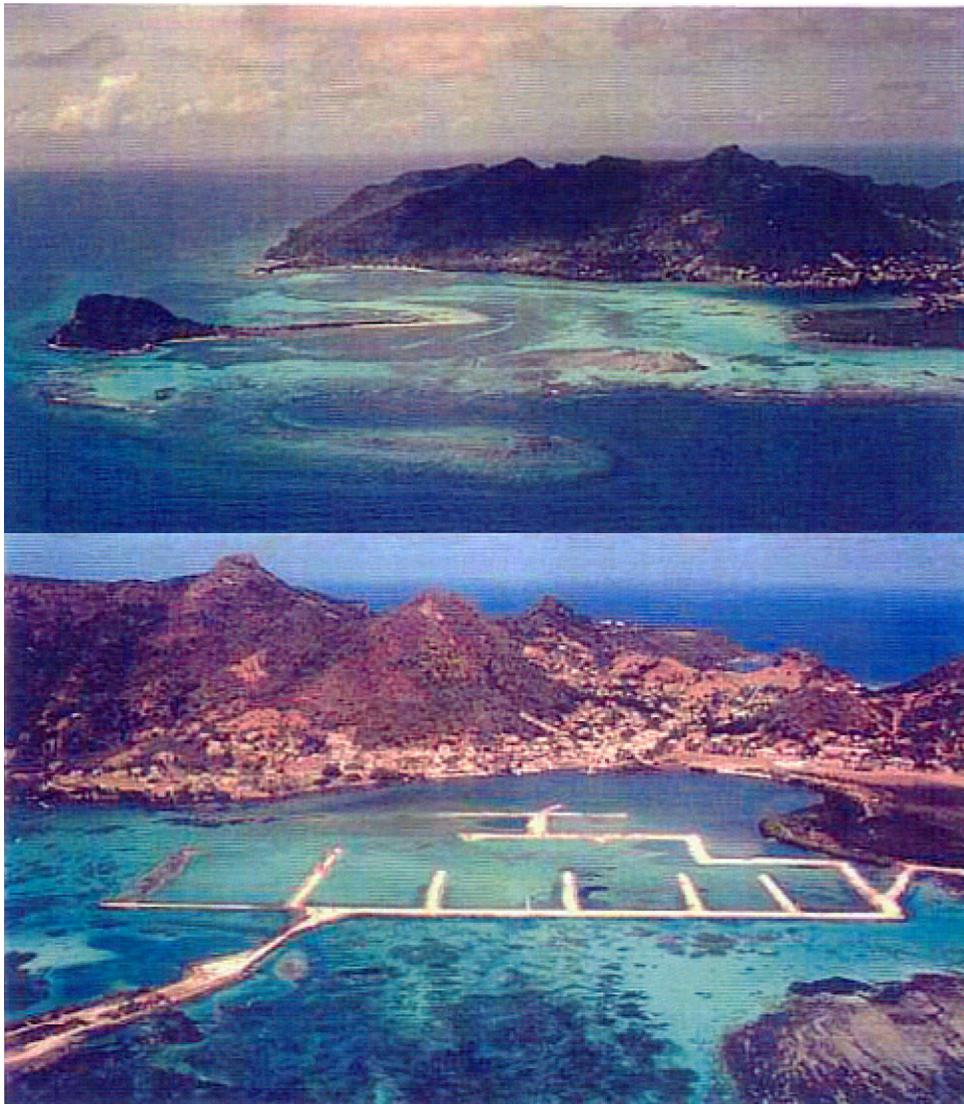


Figure 5. (a) The top image shows Ashton Lagoon before 1993 and prior to development. (b) The bottom image shows Ashton Lagoon in 1997, after the Ashton Marina Project was abandoned (Price & Price, 1998).

as lobster, conch, and several finfish (Price & Price, 1998). It is also an important habitat for wintering and migrating seabirds, shorebirds, waterbirds and landbirds (Sorenson, 2008). Its designation as a marine conservation area prohibited fishing, wildlife destruction, dredging, pollution, and construction without governmental consent.

3.3.2. *Ashton Marina Project (adapted from Price & Price, 1994)*

Ashton Lagoon had remained relatively undisturbed until the early-1990s, when the construction for the Ashton Marina Project was awarded to the Italian company, Valdetaro Construction, despite its status as a marine conservation area. According to Price & Price (1998), there were no long-term financial cost-benefit analyses completed, no sociological or environmental impact assessments (EIA) commissioned, and no public stakeholder meetings—similar to other largescale development projects the GoSVG was negotiating throughout the archipelago. The plan involved the construction of a 300-berth marina, anchorage, and entrance channel, which would involve dredging seagrass beds and patch reefs of half the lagoon. Over 100 villas, apartments, and shops were to be built on filled-in space on and before the outer reefs, and a golf course was to be constructed on 50 acres of cleared mangrove habitat. Additionally, it was planned that a causeway would be built, connecting Union Island to Frigate Island, where a recreation centre would involve the clearing of most native vegetation. Price & Price (1994) believed that environmental consequences had not been adequately considered for a project of such scale.

However, shortly after the project began, Valdetaro Construction declared bankruptcy after allegations of corruption and money laundering (Price & Price, 1998). The Ashton Marina Project was expected to transform Union Island for the better, though its abandonment led to it affecting Union for the worse (Phillimore, 2013). Before cessation of the project, the causeway connecting Union Island to Frigate Island and an attached network of finger piers was constructed (Fig 5b). This severed the flow between the eastern and western parts of the lagoon, changing current paths and causing sedimentation east of the causeway, and stagnation to the west, preventing the flushing of wastewater from the town of Ashton (Price & Price, 1998). Furthermore, the road surrounding the mangrove stock prevented the movement of water and wildlife between the salt pond, mangrove, and ocean habitat (Price & Price, 1998). Dredging, sedimentation and elevated temperatures led to the loss of seagrass habitat and the death of patch reefs, resulting in a decrease in biodiversity (Price & Price, 1998). A participatory 3-dimensional

mapping (P3DM) process that came to Union Island in 2013, led many Unionites to realize that what seemed like a quick fix to unemployment issues resulted in severe coastal repercussions, increasing the participants understanding of the value of different ecosystems on the island (Pedrick, 2016).

3.3.3. Restoration of Ashton Lagoon

The first step in restoring the area was ‘Phase I: A Participatory Planning Workshop for the Restoration of Ashton Lagoon’, which was sponsored by the Society for the Conservation and Study of Caribbean Birds (now BirdsCaribbean) in collaboration with the Sustainable Grenadines Project (now SusGren) and AvianEyes Birding Group, and funded by the Neotropical Migratory Bird Conservation Act (NMBCA) Fund of the US Fish and Wildlife Service (Sorenson, 2008). This involved a three-day workshop that aimed to determine the community’s vision for the sustainable use of Ashton Lagoon, and establish steps to achieving this goal (Sorenson, 2008). A total of 37 participants attended the workshop, including local NGOs, members of government, fishers, business owners and residents (Sorenson, 2008). Common problem themes that arose regarding the Ashton Marina Project were grouped into categories: the environment, governance, and public awareness (Sorenson, 2008). The aftermath of this workshop resulted in four immediate objectives as listed by Sorenson (2008), and are as follows:

1. The natural ecological processes in Ashton Lagoon are restored and the lagoon once again supports biodiversity and provides important ecological services
2. Awareness and appreciation of the links between the environment and sustainable livelihoods and the importance of using our natural resources wisely is increased among the public, stakeholders, government officials and politicians
3. Sustainable local tourism and livelihood employment opportunities are developed for local people
4. Legislation is revised and local decision-making capacity is improved

The second step, titled ‘Phase II: An Interpretive Framework and Management Workshop for the Area’ was awarded funding in 2010 from NMBCA, but SusGren lost the funding due to delayed approval from the GoSVG (Sustainable Grenadines, 2016). However, in 2015, the

GoSVG provided SusGren with Cabinet approval to restore Ashton Lagoon (Sustainable Grenadines, 2016). In 2017, SusGren was awarded funding from the KfW German Development Bank through the Caribbean Community Climate Change Centre (CCCCC) to carry out the project titled ‘Restoring Ashton Lagoon’s Ecosystem to Promote Nature Based Adaptation to Climate Change while Creating Sustainable Livelihoods Opportunities for the people of Union Island’—more broadly referred to as the Ashton Lagoon Restoration Project (ALRP). Similar to the outcomes of the Participatory Planning Workshop, the objectives as stated in the project proposal (Sustainable Grenadines, 2016), include:

- a) To restore the Ashton Lagoon ecosystem, including its mangrove and salt pond habitat, to create a conducive environment for fisheries, coral and mangrove restoration, and bird habitat, while increasing the coastal resilience to climate change
- b) To strengthen community resilience to climate change for long term adaptive management of Ashton Lagoon while promoting opportunities for sustainable livelihoods and ecosystem resilience to climate change impacts
- c) To implement an effective communication, education and awareness program for the Ashton Lagoon area to increase awareness and appreciation of natural resource management and climate change adaptation among the public, stakeholders and government.

Some of the specific project activities of the ALRP to be carried out by SusGren and community members include (Sustainable Grenadines, 2016):

- Creating breaches in the causeway to remove the abiotic barrier and restore circulation in the inner reaches of the lagoon (Fig. 6); and the creation of mangrove islands
- Installing culverts through the road which blocks flow of water between the salt pond, mangrove, and open ocean
- Replanting mangroves in the inner portion of the lagoon which experienced some die-off
- Training local guides, creating a set of ecotourism products, and building climate resilient supporting infrastructure to support diversification of sustainable livelihood opportunities
- Installation of moorings in the lagoon
- Communication, outreach, and education to increase awareness of natural resource use and climate change

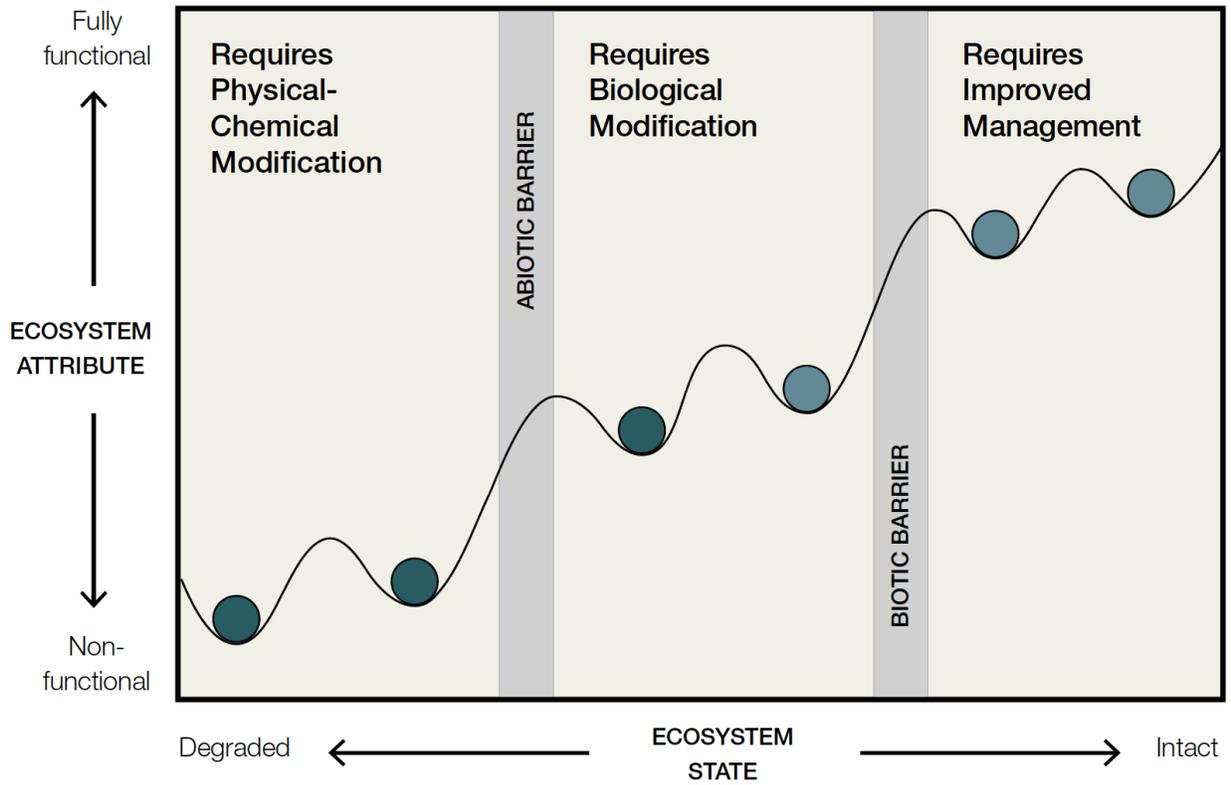


Figure 6. A simplified model for ecosystem degradation and restoration. Circles represent alternative ecosystem states and the width and depth of the cups represents resilience. Ashton Lagoon would have been in the far-left category, the causeway acting an abiotic barrier between ecosystem states that requires restoration to move toward a more ‘intact’ state (cited in Keenleyside, 2012).

Chapter 4: Caribbean Marine Ecosystems and Tourism Pressures

4.1. Coral reefs

4.1.1. Ecosystem characteristics and services

Less than 1% of the ocean provides suitable habitat for scleractinian (stony) corals (Carilli, 2013). These reef-building corals draw calcium carbonate from the seawater to build exoskeleton colonies for their individual cnidarian polyps which require very specific environmental factors, including water temperatures between 21 and 29 degrees Celsius, suitable substrate for settlement, and relatively high clarity (Humann & DeLoach, 2013). Predominantly oligotrophic, nitrogen-limited systems are necessary for the symbiotic zooxanthellae to photosynthesize within the corals tissues, providing a large proportion of the primary production created on coral reefs (Dobson & Frid, 2009). The other source of primary production comes from macroalgae that grows on the reef, which is controlled by the grazing of reef fish (Dobson & Frid, 2009).

Coral reefs are estimated to be among the most biodiverse ecosystems on the planet, providing habitat for commercially and non-commercially valuable fish species and providing food for millions of humans (Carilli, 2013). This biodiversity attracts extractive and non-extractive industries such as fishing and tourism, which provides employment and income for the communities that depend on the reefs. Globally, coral reef tourism is conservatively calculated to have an annual value of approximately US\$35.8 billion, a combination of adjacent and on-reef expenditure of international and domestic visitors (Spalding et al., 2017). The physical structures of reefs also protect coastlines from erosion from storm surges, and the erosion of the reefs contributes to land formation (Carilli, 2013). Healthy, growing reefs thus provide a source of climate change resilience for coastal communities as storm surges become more powerful and wave-overtopping more common (Beetham et al., 2017). Additionally, coral reef organisms have been used in the treatment of diseases like cancer and HIV, and may very well continue to contribute to medical advancements (WWF, 2017a).

4.1.2. Direct and indirect tourism pressures

Nature tourism activities such as SCUBA diving, snorkelling, and reef walking have all been recorded having detrimental impacts on reef health. In Akumal Bay, Mexico, an area where the number of monthly snorkellers increased by 400% over 3 years experienced almost an 80%

loss of coral cover, accompanied by a decline in fish abundance (Gil et al., 2015). SCUBA diving tourism has been associated with a 3-fold increase in coral disease prevalence, and significantly higher rates of sponge overgrowth, physical injury, and tissue necrosis at high-use sites when compared to low-use sites (Lamb et al., 2014). Fin kicks are the main cause of direct physical damage from SCUBA divers, with about 15% of divers damaging or breaking corals on recreational dives (Rouphael & Inglis, 2001). Since more fragile corals, such as branching or plating types, are more susceptible to breakage, direct tourism impacts may affect the species composition of the reef, more than reef cover (Gil et al., 2015; Cowburn et al., 2018).

Temporary occurrences of tourists can also cause short-term behaviour changes in reef fish, contributing to shifts in assemblage structure (Albuquerque et al., 2015). Reefs visited by tourists have been documented to have lower species richness and smaller fish sizes (Albuquerque et al., 2015). Reef walks on the Great Barrier Reef have resulted in increased sedimentation, and lower abundances of live hard coral and associated butterflyfish (Williamson et al., 2017). Additionally, the handling of sea cucumbers is often encouraged since they are not harmful, however this causes stress, affecting the animals' short-term productivity and may therefore impact the sediment bioturbation on the reef (Williamson et al., 2017).

Some of the most pertinent threats corals face are from land-based activities. Anywhere there is a market for tourism, either terrestrial or marine based, there will be increased infrastructure and development for tourist accommodation and resource provision. Chronic inputs from any coastal developments, such as agriculture and wastewater effluent, disturb the naturally oligotrophic state of these environments (Baker et al., 2013). The amount of algal cover and loose sediment is increased on reefs closest to resorts, indicating higher levels of both nutrient contamination and physical disturbance (Cowburn et al., 2018). These impacts are often increased during initial resort construction, which can have acute impacts on coral cover and abundance in the surrounding reefs, with fewer large coral heads observed around newer resorts (Cowburn et al., 2018). Furthermore, increases in tourist visitations have been positively correlated with rising nitrogen levels, with a large percentage of coastal marine nitrogen being sewage-derived (Baker et al., 2013). This can lead to eutrophication of the coastal zone, limiting light penetration. Dissolved inorganic nutrients can reduce calcification and fertilization rates in corals, while turbidity-related light limitation and sedimentation reduces photosynthesis, growth, and survival in many species (Fabricius, 2005). The minimum light requirements of different

species range from less than 1%, up to 60% of surface irradiance, resulting in different tolerance limits of coral systems to chronic sediment suspension (Erftemeijer et al., 2012). This likely contributes to algal overgrowth, increased disease incidence, and an overall loss of coral cover and diversity (Baker et al., 2013). Furthermore, sedimentation can cause smothering and burial of polyps, leading to tissue necrosis and bacterial infections, while also decreasing recruitment, survival, and settlement of coral larvae (Erftemeijer et al., 2012).

4.2. Mangrove Forests

4.2.1. Ecosystem characteristics and services

Much like coral reefs, mangrove forests are extremely productive ecosystems. They are estimated to be among the most carbon-rich forests in the tropics, consisting of deep organic-rich soils and high carbon storage (an average 1,023Mg carbon per hectare—more than twice as much as is stored in boreal, temperate, and tropical upland forests) (Donato et al., 2011). Mangrove species are present in bays, estuaries, lagoons, and backwaters of tropical and subtropical environments, providing important habitat for several species of insects, birds, meiofauna, and macrofauna (Mukherjee et al., 2014). In the Caribbean, mangroves act as a nursery ground for juvenile reef fish species, most notably for the ecologically important and ‘vulnerable’ parrotfish (Nagelkerken, 2007).

As with coral reefs, mangroves provide habitat for many fish, crustacean, and mollusc species, establishing the basis for coastal fisheries and contributing to coral reef fisheries via their roles as nurseries (WWF, 2017b). Mangrove roots act as sediment traps in coastal areas, reducing water flow and increasing the deposition of particles, thus reducing sedimentation in the surrounding waters, including on coral reefs (Dobson & Frid, 2009). This also secures coastlines, decreasing coastal erosion and high landward wind speeds (Mukherjee et al., 2014). Mangrove forests are also net exporters of particulate organic carbon (Dobson & Frid, 2009), and can contribute up to 10% of the terrestrially-sourced dissolved organic carbon in the nearshore seas despite only covering 0.1% of the earth’s surface (Lee et al., 2014b). It has been estimated that mangroves provide at least US\$1.6 billion annually through ecosystem services such as waste regulation and coastal robustness (Costanza et al., 1997).

4.2.2. *Direct and indirect tourism pressures*

The main threat to mangroves is their removal. Historically, this has been due to clearing for agriculture, aquaculture, and coastal development, or logged for timber and fuel (Polidoro et al., 2010). However, more recently, coastal development including tourism have been among the causes for clearing and damage (WWF, 2017b). The deforestation of mangroves is estimated to contribute as much as 10 percent of the carbon emissions released from deforestation globally each year (Donato et al., 2011). Further, the removal of mangroves adjacent to coral reefs may affect the success of reef fish species, so the connectivity of coral reefs and mangroves should be maintained (Kimirei et al., 2013).

4.3. Seagrass Beds

4.3.1. *Ecosystem characteristics and services*

Unlike corals and mangroves, seagrass ecosystems occur globally where the physical properties permit—this includes soft sediments and places where water movement and ice scour will not tear up the roots (Dobson & Frid, 2009). Seagrass beds often form in the protected lagoon between barrier reefs and the coastline, forming shared habitat with corals and mangroves for many species (Short et al., 2007). There are less than 60 known species worldwide, the highest diversity of seagrass species being in the tropical Indo-Pacific (Short et al., 2007).

Seagrasses are related to terrestrial plants and have a true root system, and they are up to three times more productive than macroalgae (Dobson & Frid, 2009). Meadows provide habitat for epiphytic plants, filter-feeding organisms, and refuge and nursery ground for small or juvenile fish species (Orth et al., 2006). Further, blades are directly grazed upon by macro fauna such as gastropod molluscs, sea turtles, endangered dugongs and manatees (Dobson & Frid, 2009). It is estimated that since 1980, seagrasses have been disappearing at a rate of 110km² per year, making it one of the most endangered ecosystems alongside coral reefs and mangrove forests (Waycott et al., 2009).

Seagrasses act as ecosystem engineers that alter flow regimes and sedimentation patterns, and increase organic matter cycling through the provision of detritus to the benthos (Dobson & Frid, 2009). They are responsible for producing large quantities of organic carbon, and they form important zones for carbon sequestration (Orth et al., 2006). It is estimated that seagrass meadows provide approximately \$1.9 trillion per year by the process of nutrient cycling alone

(Waycott et al., 2009). Like mangroves, seagrasses also act as a sediment traps, decreasing the turbidity in surrounding waters (Dobson & Frid, 2009). They are therefore supportive in the productivity of neighbouring reefs. Losses in seagrass cover have caused cascading effects, such as the collapse of scallop fisheries and reductions in seabird populations (Orth et al., 2006).

4.3.2. *Direct and indirect tourism pressures*

One of the main threats to seagrasses from the tourism sector is their intentional removal. Coastal hotel management will have seagrass beds removed due to the belief that guests find them unattractive or may be harmed by organisms dwelling in the bed (Daby, 2003). The lack of root structure and vegetation destabilizes the seafloor, resulting in increased water turbidity and a loss of infauna, thus increasing ecological vulnerability to climate change (Daby, 2003).

Boat anchoring associated with tourism also poses a threat, as private or tour boat anchors will uproot and break seagrasses as they pull through the soft sediment (La Manna et al., 2015). Since seagrass beds are often adjacent to reefs, and reefs attract dive and snorkel tourism, anchors will likely cause damage when moorings are not installed.

Coastal development indirectly stresses seagrasses through increased sediment and nutrient runoff, similar to coral reefs. Seagrasses require up to 25% incident radiation, which is among the highest light levels required of any plant group, making them extremely responsive to changes in water quality (Orth et al., 2006). Seagrasses are one of the more vulnerable ecosystems to coastal runoff, since mangroves are not dependent on clear water, and coral reefs occur farther from shore (Orth et al., 2006). Rapidly growing tourism infrastructure, agriculture or aquaculture to support the increased tourism, and tour boat effluent all contribute to coastal eutrophication, threatening the success of coastal seagrass beds (Short et al., 2006).

Chapter 5: An Introduction to Ecotourism

5.1. What is Ecotourism?

There has been a lack of agreement on the definition of ‘ecotourism’ and what it entails. Dating back to 1983, early definitions of the term did not incorporate the social and environmental benefits considered important today, but instead defined actions taken by the tourist, such as the admiration of relatively undisturbed natural areas (Braun et al., 2015). Nature tourism, which is commonly mistaken or mislabelled as ecotourism, involves travel to simply enjoy or experience natural environments (Hunt et al., 2015). What sets ecotourism apart from other types of tourism is the inclusion of ethical and positive outcomes for the areas visited (Hunt et al., 2015). The International Ecotourism Society defines ecotourism as “responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education” (TIES, 2018). Ecotourism considers wildlife habitats as significant tourism resources, as they supply unique landscapes, food sources and nesting areas, as well as educational experiences (Choi et al., 2017). However, if the various impacts of tourism weaken the resilience of wildlife habitats, the balance between the ecological and social system can be lost (Choi et al., 2017).

5.2. Benefits and Concerns

Economic empowerment from ecotourism can result in improved infrastructure, awareness and education, which can lead to social empowerment (Das & Chatterjee, 2015). In the Peruvian Amazon for example, the social value of ecotourism-controlled land is higher than all currently practiced alternatives (unsustainable logging, ranching, and agriculture), and it sequesters substantial amounts of above-ground carbon (Kirkby et al., 2010). Specifically, community-based ecotourism can help fulfil the conservation and protection of natural and cultural resources, increase community involvement and management, provide training, and assist the integration of public and private sector activities (Masud et al., 2017).

There is a mutual interdependence among the conservation of natural resources and the economic and sociocultural aspects of ecotourism (Das & Chatterjee, 2015). Ecotourism can be implemented to offset damaging extractive practices in natural areas, however, the scale at which ecotourism manifests often leads to environmental, social, and economic problems (Koens et al.,

2009). Issues associated with activities labelled as ecotourism have come from revenue leakages, inequitable distribution of income, displacement of locals, crowding and crime, and lack of education and insensitive attitudes (Das & Chatterjee, 2015). Mismanagement of these activities in some areas has led to environmental degradation and negative attitudes toward ‘ecotourism’ by locals (Das & Chatterjee, 2015).

Although ecotourism is meant to embody a set of common principles, the term is often used by commercial operators as a mere marketing tactic to broaden their targeted markets (Minca & Linda, 2000). Some even argue that regardless of how ecotourism may be marketed, it is a form of green capitalism which can lead to unequal distributional impacts, competition, individualism, material accumulation, consumption and commodification (Horton, 2009). This complicates its use as a tool for sustainable development as the economic, environmental, and social outcomes should be positive, contributing to the SDGs and fulfilling the definition of ecotourism (Koens, Dieperink, & Miranda, 2009). Although frameworks for ecotourism exist, there is not a “one size fits all” model, as differing local contexts add unique complexities (Reimer & Walter, 2013).

5.3. (Eco)tourism and ecological restoration

Many developing states uphold tourism development policy to increase revenue, but this dependence can negatively impact the destination’s environmental quality (Sirilersuang & Pongkijvorasin, 2018). Teelucksingh & Watson (2013) state that biodiversity factors are equally, if not more important than traditional economic policy levers on the demand for tourism in SIDS, especially as tourists become more environmentally conscious. Well-designed restoration projects can demonstrate how management is responding to ecosystem damage, and can improve opportunities for visitors to enjoy the area (Keenleyside et al., 2012). Furthermore, Sirilersuang and Pongkijvorasin (2018) found that optimal tourism policies potentially leading to a higher net benefit to society, consist of substantially higher restoration expenditures than tourism promotion expenditures. Increasing the effectiveness of restoration expenditure as well as the promotion of more eco-friendly and lower-impact tourism can increase benefits from tourism (Sirilersuang & Pongkijvorasin, 2018; Pueyo-Ros et al., 2018)).

The wise use of wetlands can help developing countries both protect and use natural resources—the income from economic use can be used to establish monitoring systems and

protection facilities for example (Ramírez & Fennell, 2014). Ecotourism and other forms of outdoor recreation are important for improving the quality of life for humans and increasing recognition of the ecological, sociocultural, and educational values of ecosystems like wetlands (Ramírez & Fennell, 2014). Part of the ecotourism planning strategy often includes restoring impacted land and resources to mitigate or avoid negative impacts (Blangy & Mehta, 2006).

Restoration projects have effects beyond the immediate project area, so the most desirable sites are those that are socially and ecologically compatible with the surrounding land use (Buckley et al., 2008). Though there may be pressure against incorporating human uses in ecological restoration sites from purist conservationists, many sites require income for continued management, and are often socially or culturally important to the surrounding communities (Samways et al., 2010). Furthermore, ecotourism infrastructure is recommended to be developed in previously disturbed sites whenever possible, where it can be a driver of ecological restoration (Mehta et al., 2002).

Chapter 6: Results

6.1. Natural Capital

Natural capital refers to any natural assets that provide valuable goods and services, including the structure and biodiversity of ecosystems and exceptional areas of natural beauty (Roseland, 2012). Participants were asked to reflect on the protection of Ashton Lagoon, as well as the state of the marine environment and how it is treated (full list of questions can be found in Appendix A). A summary of these responses is listed in Table 2.

6.1.1. Protection of Ashton Lagoon

While Ashton Lagoon is presently protected, one respondent commented that many areas on the island have been named reserves simply because nobody wants them, and many have not been gazetted. Most respondents thought that Ashton Lagoon should be protected to some extent, to limit some destructive or extractive practices, but stressed that the continued use of the area is essential. One respondent has observed spear fishers in the lagoon, and raised concern that this would impact populations if fish are coming to spawn. It was added that protection alone can be a driver for people to be willing to pay to see it. Another respondent said that people are unhappy because they believe the mangroves are encroaching onto the land, which is used as a recreation area. A view they added is due to a general lack of understanding of the mangroves' importance—the P3DM exercise showed how the mangroves reduce Union Island's vulnerability to flooding. Alternatively, one participant expressed concern that protection can often be pushed by organizations, but not be best for the average citizen and therefore any protection should be preceded by descriptive studies and extensive consultation. Mayreau was given as an example, which falls within the jurisdiction of the Tobago Cays Marine Park (TCMP), thus limiting fishing off its shores. They added that protection should not affect persons' daily lives, but rather benefit them by creating employment. Another respondent commented that they do not think Ashton Lagoon needs to be protected specifically, but rather the whole of the Grenadines managed through education as opposed to zoning.

6.1.2. Observations of the natural environment

Generally, the marine environment, though difficult to describe for some, was described as somewhat degraded in comparison to participants' memories of the past. One participant described an area on the southeastern coast which used to be a good spot to bathe, becoming

filled with ‘weeds’ in less than 10 years. They added that this area turns brown after rainfall, since runoff and erosion flows into this area. Two participants described the change in fish catches—one said that fishers used to be able to throw a pot just off the shore and get a lot of fish, but now they must go into deeper water. The other participant said that a couple years ago around the Tobago Cays, one could catch 20 kg of fish in a few hours, but now you could spend a whole day and not even bring in 5 kg. They added that the establishment of the TCMP has allowed more fish to return to the park, and alluded to the spillover effect eventually benefitting fishers. Two participants also mentioned memories of popular beaches on Union Island that have since been eroded, one of which was said to have lost over half of its area.

Participants described Ashton Lagoon as an area which used to host a lot of conchs and seamoss before the Ashton Marina Project. In reference to the eutrophication in Ashton Lagoon after the project, one respondent said that they could feel the pollution on their skin and hair after bathing. The loss of [black] mangroves following the project was also mentioned—the area has since been replanted with a more water tolerant species [red mangrove], as part of the restoration project, detailed in *Chapter 3.3.3*. One participant noted how the reefs in Ashton Lagoon which used to be great are now “sad”, but also commented on the widespread degradation of reefs in the area, which started in the 1990s.

6.1.3. Ecotourism and human action

Some of the participants mentioned that while any influx of tourism would have an impact on the natural environment, impacts can be mitigated with careful planning and waste management. Most participants mentioned how ecotourism could have a positive effect on the environment through protection and behaviour change, once people realize the value of the environment as a tourism product. It was also stated that once locals begin treating the environment better, tourists will follow the trend. One participant commented on the maintenance of natural ecosystems beyond projects, saying, “We can’t depend on funders to fund the project and still sustain it”, to which they added that users of Ashton Lagoon should pay a user fee for maintenance.

Table 2. Categorized summary of respondents’ perception of the potential impact of ecotourism on *natural capital* in Ashton Lagoon, Union Island.

Strengths & Opportunities	Weaknesses & Threats
<ul style="list-style-type: none"> ▪ Ashton Lagoon already part of a protected area (UPMCA) ▪ Mangroves are mostly intact/some replanted ▪ ALRP created breaches in causeway and installed culverts, reintroducing flow ▪ Ecotourism can lead to appreciation and behaviour changes 	<ul style="list-style-type: none"> ▪ Lack of understanding of importance of mangroves on island ▪ Marine environment is degraded ▪ <i>Sargassum</i> influx ▪ Erosion and run-off in the near-shore environment ▪ Constant presence of tourists can increase pressure on natural resources

6.2. Economic Capital

Economic capital refers to the way financial and business resources are allocated, and how decisions are made regarding material goods (Roseland, 2012). Participants were asked to comment on the location of Union Island and the demand for ecotourism, as well as its ability to provide reliable income as an industry. A summary of these responses is listed in Table 3.

6.2.1. Location and global reach

Union Island’s location in the Lesser Antilles provides a relatively clean marine environment with the ‘sun, sand, and sea’ that attracts people to the Caribbean in general. Furthermore, the closely clustered islands and a constant, warm wind make the Grenadines a great sailing destination, for which it is mostly known. Some of the participants also stated how Union Island’s placement between two countries is advantageous, and it often acts as a hub for the neighbouring private resort islands, and sometimes Carriacou and Mayreau. A few participants stated how Union Island’s remote location can be disadvantageous since it is distant from many overseas visitors. This makes travelling to Union costlier (outlined in detail in *Section 6.4*). Furthermore, modes of travel (small plane or ferry) may not be preferable for many people. One respondent stated that Union Island’s location slightly west of the surrounding islands causes it to suffer the most for rainfall, making the island extremely dry at times. They added that this is because rain tends to follow a pattern—the islands that are closer will experience more rain. Another participant agreed that although there are wet and dry seasons, Union Island is mostly dry.

Some participants said that they do not believe many people know about Union Island, and often do not even know where SVG is. It was added that there are not many tourist amenities—sailing and kiteboarding are the main attractions, and they are both very niche markets. One participant stated that Union Island does not have one distinguishing attraction that would encourage tourists to choose to travel there over somewhere else. They added that most of the tourist attractions are not in an ideal state and ready for visitors, and currently Union is “piggybacking” on the other attractions—the Tobago Cays and two resort islands. Other participants had the opinion that people from most countries are aware of Union Island due to its proximity to the Tobago Cays which attracts people from all over the world, adding that it may just require a bit more promotion, though this would be costly.

6.2.2. Ecotourism demand

Most respondents observed that there is the demand for ecotourism on Union Island, mostly because people inquire about what there is to do, and because they are interested in experiencing the uniqueness of the island. One respondent said, “The tourists that visit the Caribbean, especially the yachties” ... “come to see the island in its natural state. That’s what they want. If they wanted a 5-star hotel, they would have flown somewhere and gone to a 5-star hotel”. The respondent went on to say that tourists are interested in the natural environment, the people, their culture and food. Some respondents claimed that although they do not believe there is much demand for ecotourism, once it is offered and promoted, people would be interested.

6.2.3. Income from ecotourism

Almost all respondents believe that ecotourism opportunities can provide sufficient and reliable income for local people—since tourism is the prominent sector, ecotourism is expected to diversify income opportunities. One respondent added that in addition to guiding, it will create associated jobs such as rangers, caretakers, and security guards for example. It will also expose students to other job opportunities related to eco-tour guiding and biology. A participant noted that most students only know about being in the service industry, a teacher, an immigration or police officer, or a medical doctor or nurse. One respondent brought attention to a possible lack of entrepreneurial motivation or skill, stating, “There [are] a lot of young people who might be able to do tour guiding, but [don’t have] a job because they [are] waiting on somebody to give them a job. So, if you can teach them how to create their own jobs, it can bring benefits.” They added that seminars can be a useful tool in motivating youth in this aspect.

Others said that it would not necessarily provide sufficient income due to the small size of the area, and guides for example, would have to find work when there are no bookings. One participant said that Union Island does not have the diversity of birds necessary to attract substantial tourism for birding. They added that something like an ecolodge would provide more jobs through housekeeping, catering, and maintenance, and that ecotourism would need to be implemented on a large and innovative scale to provide sufficient and reliable income for more than a small fraction of the population.

Table 3. Categorized summary of respondents’ perception of the potential impact of ecotourism on *economic capital* in Ashton Lagoon, Union Island.

Strengths & Opportunities	Weaknesses & Threats
<ul style="list-style-type: none"> ▪ Part of a Caribbean archipelago that is ideal for sailing ▪ Proximity to Tobago Cays ▪ Access point for two private resort islands ▪ Presence of tourists in search of activities ▪ Yachters and kiteboarders present ▪ Diversification of income opportunities ▪ Expose youth to environment-centric careers 	<ul style="list-style-type: none"> ▪ Remote location limits international tourism ▪ Receives limited rainfall, restricting industry ▪ Lack of ‘pull’ for tourists outside of niche markets ▪ Small size of Ashton Lagoon limits size of ecotourism industry ▪ Lack of motivation for youth to create their own jobs

6.3. Human Capital

Human capital refers to attributes like knowledge, skills and competencies that allow a person to pursue and achieve livelihood objectives facilitating personal, social, and economic wellbeing (Roseland, 2012). Participants were asked to describe the access to education and training related to tourism and the environment on Union Island. A summary of these responses is listed in Table 4.

6.3.1. Ecotourism education and training

Presently, there is not much access to education or training for those who want to work in ecotourism. It was reported that while some workshops have been held by NGOs and the Ministry of Tourism/Tourism Authority, they are not frequent, and are rarely for ecotourism specifically. It was stated that people will come out of school not knowing about the island, its

history, customer service, or the value of visitors and how the natural aspects of the island are an attraction. One respondent said that there are more diverse subjects offered at schools in St. Vincent because they have a greater range of teachers. Another said that people only have access to education in what they have already been doing, so people would not have the experience to teach activities that they have not had the opportunity to try, like kayaking for example. Therefore, to get that type of training, someone would have to go off island or someone would have to be brought in. It was stated that in tourism workshops held by the government, problems faced in Union Island and their potential solutions were brought up, but "...it goes on record and nothing happens after that", highlighting limited mobilization of human capital needs.

6.3.2. Environmental education

All participants agreed that ecotourism would be useful in educating residents about the natural environment. It was stated that once people understand its benefits and the associated income, it will be a good way for them to reconnect with their history. It was also mentioned that local people like to support initiatives, and would make themselves available for training sessions related to ecotourism. An example was given that, if a parent was employed in ecotourism, environmental awareness would likely spread to their children and other parents. One participant added that getting involved with tourists and organizations is how they became concerned about the environment.

Table 4. Categorized summary of respondents' perception of the potential impact of ecotourism on *human capital* in Ashton Lagoon, Union Island.

Strengths & Opportunities	Weaknesses & Threats
<ul style="list-style-type: none"> ▪ Ecotourism can educate residents about their natural environment and resources ▪ Infrastructure for training sessions 	<ul style="list-style-type: none"> ▪ Limited education and training on island for both students and young professionals ▪ For specialty training, guides would have to go off island, or someone would have to be brought to Union Island

6.4. Physical Capital

Physical capital refers to the infrastructure that supports basic needs, such as shelter and access to food and water, as well as equipment and machinery that can be used to generate income through the provision of goods and services (Roseland, 2012). Participants were asked

about the access to freshwater, spatial land and water use, waste management, transportation, and access to goods on Union Island. A summary of these responses is listed in Table 5.

6.4.1. Freshwater access

While there is access to freshwater, most respondents mentioned how not enough is easily accessible year-round. Since there are no rivers or freshwater bodies, most people have their own catchments for storing rain water. The water collected during the rainy season (approximately May to November) is therefore meant to last through the dry season (approximately December to April). Recently, following a long dry season, the Union Island Environmental Attackers (UIEA), a local NGO, facilitated a project to supply 157 individual homes with 1000-gallon water tanks to increase the island's storage capacity. When individual catchments run out, there are government catchments that are available, and if those were to empty, water is transported down from mainland St. Vincent—though it was mentioned that this has not happened in a long time. It was also stated that the government recently reconstructed one of the catchments to increase capacity. However, some participants emphasized that it is often those who live “hand-to-mouth” who suffer the most. Since they would only be able to afford a small catchment, they will have to go to the government catchments to collect water, and pay someone to transport it back to their home, thus making them poorer. One respondent believed that this is a service that should be subsidized by the government. The change in season predictability was also mentioned by some of the participants, since it is no longer as certain which months rain should be coming or not. Another participant expressed this having a positive effect on water accessibility, since the seasons are less distinct and showers are recently occurring more frequently in the ‘dry’ months.

Some of the participants did not believe that this system would have an effect on tourism growth, since hotels have their own desalination processes, and any new businesses would easily build a catchment, or install desalination plants so long as they had the funds. Others perceived some effects on tourism development. One participant stated that if people need to get water during a drought, their priority would not be to provide a service. Another said that a desalination plant on the island would allow better services to be provided to tourists, and allow more produce to be grown locally. Some respondents said that tourism should not affect people's access to water, since developments wouldn't impinge on a freshwater source like a stream or lake, and because most locals have their own water catchment. Others said it may, if places

providing services run out of their supply more quickly. This would result in more people going to the government catchments, which are managed to last through the dry season, and could result in it emptying sooner. One participant added that if tourism increased, the government would see a need to have something in place to provide water year-round to address the issue, and to maintain tourist levels.

6.4.2. Land and water use

Most participants did not perceive tourism as conflicting with other land and water use at present, some saying that there is still space for tourism developments. One participant hoped to see more development, saying there is great potential for tourism development and a lot of unused land space. Another respondent stated that they do not believe locals have been, or will be “cheated of space”, which was then compared to Canouan, where much of the island and its beaches are owned by private tourism businesses. One participant stated that if an area such as Ashton Lagoon is protected for nonconsumptive uses, it could cause conflict with those who might normally fish in the area. Two participants indicated conflicts of use between potential developers and ecological uses, such as the development of the Ashton Marina Project. One example was that if critical habitat for Union Island’s endemic gecko is marked for tourism development, it would decrease the species’ range.

6.4.3. Waste management

It was mainly expressed that while collection of waste on Union Island is good, there is much room for improvement. Currently, waste is brought to a landfill in Clifton which is close to many residences and overfilled, to which one respondent commented: “If you say that Clifton is the city of Union Island, then our garbage is in the middle of our city, and it’s uncontrollable.” Furthermore, it was reported that some people will dispose of their garbage anywhere, resulting in waste all around houses and on some beaches.

Since yachting is the main form of tourism, there is the production of garbage from individual yachts in addition to local garbage. One respondent added that much of the garbage from yachts that was given to water taxi operators ended up in the ocean, as a short cut to bringing it back to the landfill. In response, the Southern Grenadines Water Taxi Association was awarded a project to collect garbage from yachts in the TCMP and surrounding waters for a small fee. However, one participant stated, “If you have 6000 yachts coming in, 6000 yachts producing three times what the houses produce, that’s a whole lot of garbage coming from

yachts. And we don't have proper storage for it, you know. So, we're importing garbage.” Effluent from hotels and yachts that don't have waste management regulations was also expressed as a concern for coastal marine ecosystem health.

Some of the participants concluded that waste management is currently, or would likely impact tourism development, since visitors, especially ecotourists, would not want to stay in a place that is polluted. Specific attention was brought to the waste collection site at the main harbour, which has become a “breeding ground for rats”. Others said that they don't believe the waste management system will influence tourism, but solutions are needed for what will be done with the waste, post collection. The need for a new landfill location, more bins around Clifton, as well as recycling and composting were stated as needed to tackle this issue. Respondents said that the systems would have to compensate for an increase in tourists, particularly ecotourists, which could pressure the government to improve waste management on Union Island. Additionally, if waste is being managed well, it could encourage yachties to hold onto their waste and dispose of it in a bigger area that has the proper facilities.

Although the topic of waste management was intended to address garbage disposal, some participants commented on waste disposal more generally, adding that there are approximately 806 homes on Union Island, most of which have septic tanks and septic fields, and additionally that there is nowhere to properly dispose of motor oil after an oil change. The issue of *Sargassum* seaweed influx was also mentioned—though it is not waste—to have a negative impact on tourism due to the strong odour it produces.

6.4.4. Transportation

It was stated that transportation both to and around Union Island, while available, is less than ideal. In summary, one participant said, “To Union is expensive, around Union is expensive and random”. Transportation around Union Island is primarily by private vehicle or public transport by van. While there are always taxis available, they are expensive, and buses are unpredictable since they do not work on a schedule, and it is not always guaranteed that they will be on the road at any time. One participant stated that this system was more reliable in the past, since there were more buses on the road, and they worked on a consistent schedule.

Transportation to Union Island is by air, ferry, or water taxi. It was stated that in the past, there used to be boats and planes arriving and leaving every day, and it was cheaper to travel. Participants mentioned that the Union Island airstrip used to be extremely busy since people

would take day trips from throughout the Lesser Antilles to see the Tobago Cays, and planes would circle the island waiting their turn to land. However, management complications led to decreased air traffic and fewer visitors, and flights to St. Vincent are now much more limited. It was also reported that the three airlines servicing Union Island formed an alliance, and now maintain an oligopoly. There also used to be more yacht companies on Union Island, catering to European tourists arriving via other islands, who could pick up a yacht the same day or vice versa, but the decrease in air traffic caused many of these companies to pull out. To arrive by sea, there are cargo/passenger boats which arrive a few times per week, which are described by participants as terrible, unreliable, uncomfortable, long and monotonous. One participant said, “Sometimes people get on the ferry [in St. Vincent] at like 11 a.m. because they don’t want to miss it, and then the ferry leaves at 3 or 4 [p.m.], then they end up [in Union Island] at 2 o’clock in the morning the next day”. There used to be a fast ferry which ran frequently for three years, but is no longer operational. Many water taxis are available which have fixed prices for shorter trips to the neighbouring islands.

Most recipients perceived transportation systems as having a very negative effect on tourism. Due to the decrease in flights to mainland St. Vincent, some participants mentioned a loss in potential day tourists from within SVG. Now, there is maybe one flight per day from St. Vincent, which holds only 19 passengers, servicing both tourists and locals. Where one used to be able to fly to Union in the morning and return in the evening, this is no longer possible, and would require overnighing on Union. Additionally, early morning flights are now only available on certain days of the week. Furthermore, the little access available by air is very expensive. The example was given that it is more expensive to fly from Barbados to Union Island than it is to fly from North America to Barbados. Another participant observed that some people may be afraid to take the small planes, and the alternative is the long and unpredictable cargo boat trip, which could be discouraging.

Some participants agreed that the ferry service needs to be improved: “...On the sea, we have no designated time, it’s the most ridiculous thing”, to which they added that for tourism, a system needs to be controlled and running on a schedule. Furthermore, since Union is the furthest island within SVG from the mainland, it is the most expensive to get to, and prices have increased. One participant stated that this puts them at a disadvantage since people do not need to travel to the Grenadines like people will need to go to St. Vincent, but if the cost was less, more

people would travel to the Grenadines just because it's affordable. When asked if an increase in tourism might affect the transportation system, one respondent said that more demand could encourage a further increase in prices rather than an improvement in accessibility. Another respondent said that the services provided by the airlines may change, particularly if the price is lowered—the services being that the flight will wait for passengers on late connecting flights, and often waive fees for additional baggage. Other participants would envisage a decrease in prices accompanying more flights, and more taxi drivers, potentially leading to a standardized cost like the water taxis. However, some believed that tourism wouldn't change the current method of transportation, but rather the system needs to change to attract more tourists. One participant stated that the skies need to be opened, so competition can do its work and Union Island can benefit.

6.4.5. Access to goods

Almost all respondents stressed that access to goods is mostly limited by price. While basic items are accessible, anything brought in is subject to high shipping fees and Value Added Tax (VAT). If something specific is needed, one would need to leave the island to get it, or have it delivered. One example given was the difference between building a house on Union versus mainland St. Vincent—since one would have to pay to transport all the materials down to Union, the same budget would result in a much smaller house. One respondent stated that since people know that goods are more expensive in Union, they will buy them on other islands in anticipation of the higher costs. This leads to local businesses selling less, but still having to accept the garbage for goods bought elsewhere, and the “importation of garbage” which was mentioned previously. In terms of food, two specific issues were raised: one being that produce vendors will set prices high, meaning much of it spoils, as opposed to setting a more reasonable price and selling everything; the other being that food will sometimes travel a full day to Union without proper cold storage, which could foster bacterial growth.

Most respondents perceived access to goods as a barrier for anyone wanting to develop independent ecotourism businesses. It becomes difficult to maintain and replace gear with the price of shipping and duty, because if one cannot pay for something, they ultimately do not have access. For example, to replace a broken part, the cost of shipping and duty could more than double the cost of the item, but it was further mentioned that it could take an additional week for goods to get from mainland St. Vincent to Union Island, limiting effective business practice. One

respondent pointed out that this means to invest in a business, one would need assurance of a certain volume of tourists.

Table 5. Categorized summary of respondents’ perception of the potential impact of ecotourism on *physical capital* in Ashton Lagoon, Union Island.

Strengths & Opportunities	Weaknesses & Threats
<ul style="list-style-type: none"> ▪ Recently increased freshwater storage capacity ▪ Ample space on island for tourism sector development ▪ Access by air (updated airstrip) and sea ▪ Southern Grenadines Water Taxi Association set fixed rates ▪ Ecotourists could increase pressure to improve waste management 	<ul style="list-style-type: none"> ▪ Limited freshwater access year-round could impact tourism services ▪ Waste storage is limited; garbage is being “imported”; lack of waste management policy ▪ Inappropriate garbage disposal is common ▪ Waste collection site at the harbour is unsightly and malodorous ▪ Transportation systems are expensive and often irregular or infrequent ▪ Access to goods is expensive, limiting independent businesses

6.5. Social Capital

Social capital refers to community characteristics including relationships, networks, norms, reciprocity, and commonly accepted standards among other things (Roseland, 2012). Participants were asked to talk about their observations of common attitudes in society, social bonds, and the prevalence of violence and crime. A summary of these responses is listed in Table 6.

6.5.1. Social connections

Most respondents agreed that there are strong social connections on Union Island. Since the island is so small, people are always connected, with one person stating that “everybody is family with everybody, everybody is friends with everybody”. One participant described social connections as “so-so”, since one would expect very strong connections on an island that small, but there is still disparity between the cities of Clifton and Ashton, that can result in jealousy or favouritism. Another participant who commented on this disparity said that these “rivalries” were the result of strong social connections.

When asked whether they thought tourism would influence social connections, most respondents did not think it would. Two participants stated that if it got too busy, like on the scale of mass tourism, people might be busier working and have less time to connect socially. Another participant added that an increase in tourism may have a positive effect on social connections, as more income would result in more spending money. One participant perceived a positive and negative effect on water taxi operators. On the plus side, tourism led to the creation of the Southern Grenadines Water Taxi Association. However, water taxi operators are blamed for many of the issues with tourists, and with the Association in place, if one would cause a problem, they all would be blamed. Furthermore, it was added that in the past, tourism has augmented the polarization between cities as mentioned above. When it was more common for tourists to be harassed, people in Clifton (main tourist town) would blame those in Ashton for taking advantage and running tourists away, since they did not understand the importance of tourists.

6.5.2. Violence and Crime

Responses implied a common perception that Union Island is a safe place to live and travel to. All respondents stated that Union Island experiences a low level of crime (incidents maybe once a year, as stated by one participant), but when it does occur, it is usually tourists who are the target of petty theft, usually in the form of yacht break-ins. However, a few participants stated that it is not necessarily Unionites who are responsible for these break-ins. Since the islands are all so close, people will break into yachts from neighbouring islands. Participants could only recall one or two violent crimes that they knew of occurring on Union Island. One respondent stated that locals overcharging tourists was also a crime, since the government has set fixed prices for certain goods and services.

6.5.3. Common attitudes in society – Climate change

It was mostly agreed that while weather patterns may be discussed, climate change is not typically included in these discussions on Union Island, despite experiencing the effects of it. It was stated that, while people don't have a full understanding of what climate change is, why it's happening, or that it's a global issue, more people are becoming aware that it exists, causing things like longer dry seasons and *Sargassum* influxes, though they do not necessarily see it as a direct or immediate threat. One participant stated that although climate change has been present for a very long time, the term was not established; now that it is, more people are catching on

and “believing in” climate change, though there are a lot of negative effects people don’t believe, or don’t pay attention to. Other than an advertisement on TV about pollution destroying the ozone layer, only one NGO in the Grenadines has attempted to bring climate change awareness to residents on Union Island as yet.

6.5.4. Common attitudes in society – Tourism

Most participants agreed that there is generally a positive and welcoming attitude toward tourists, due to the understanding that tourism is many people’s source of livelihood. However, it was stated that while it is improving, there are still some people who perceive tourists as an easy source of income, and may exploit tourists by over-selling products and services. One respondent said some people erroneously believe tourists have an obligation to come to Union and spend—that no matter what they do, tourists will come. Another respondent said that tourism is a relatively new product on Union Island, and that “50 years ago you never used to see a white person walking in Union”, but emphasized that people are becoming more welcoming to make tourists feel comfortable and continue receiving their expenditure.

Table 6. Categorized summary of respondents’ perception of the potential impact of ecotourism on *social capital* in Ashton Lagoon, Union Island.

Strengths & Opportunities	Weaknesses & Threats
<ul style="list-style-type: none"> ▪ Increased income from tourism could improve social connection ▪ Very little violence or crime on Union Island ▪ Most residents have a positive and welcoming attitude toward tourists 	<ul style="list-style-type: none"> ▪ Tourism can stimulate or augment conflict between social groups ▪ Proximity to other islands increases potential of theft by non-Unionites ▪ Tourists sometimes overcharged for goods and services ▪ Lack of widespread understanding of climate change and impacts

6.6. Cultural Capital

Cultural capital refers to the product of shared experience through traditions, customs, values, heritage, identity and history (Roseland, 2012). Participants were asked to discuss cultural tradition on Union Island and its interaction with tourism. A summary of these responses is listed in Table 7.

6.6.1. Cultural tradition

Though most respondents stated that Union Island boasts a strong presence of cultural tradition, most also stated that it not as prevalent as it once was. The Maroon Festival and Big Drum dance, Emancipation Day customs, boat launching festivals, and Christmas caroling were all mentioned as cultural practices that have lost substantiality, if still practiced at all.

All respondents did not believe that tourism of any kind has had a negative impact on their culture, and that it likely will not. In fact, most stated that the relationship between tourism or ecotourism and culture can be beneficial, as tourists are pleased to know that the island has culture, making tourism a reason to preserve it. One respondent stated that “the only reason why [cultural practices are] still there is because some persons see there may be a little money to be made from it”. One respondent said that social media is likely the cause for the diminishing of cultural traditions, since everyone has access to it and is trying to follow other peoples’ way of life, resulting in European culture becoming dominant. In relation to tourism, they added, “We’re supposed to stick to our roots, stick to our culture, and let people know our roots and our culture instead of trying to profess their own culture to them”. Another participant stated that some people have a negative attitude toward visitors bringing their culture, or doing things on Union that they would not normally do at home. This was mentioned in reference to dress not being compatible with the local culture—for example, tourists wearing swimwear in the street or shops.

Most respondents also perceived a potential positive cultural impact from the development of ecotourism in Ashton Lagoon. It was stated that the culture of Union Island specifically could be sold as part of the ecotourism package, since people would want to have cultural experiences through food, music and history, that is distinctive from other islands. The possibility of higher fish stocks due to protection for ecotourism positively impacting those who consider fishing an important part of their culture, was also stated. On the other hand, it was also brought up that protection could impinge on cultural practices such as recreational bird hunting in the mangroves.

Table 7. Categorized summary of respondents’ perception of the potential impact of ecotourism on *cultural capital* in Ashton Lagoon, Union Island.

Strengths & Opportunities	Weaknesses & Threats
<ul style="list-style-type: none"> ▪ (Eco)tourism could encourage preservation of cultural practices ▪ Including culture of Unionites could improve ecotourism experiences ▪ Improved environment after restoration could positively impact artisanal fishers 	<ul style="list-style-type: none"> ▪ Cultural tradition has decreased substantially in the last 20-30 years ▪ Some cultural norms are incompatible with tourist actions ▪ Protection or zoning of Ashton Lagoon could impinge on cultural practices

Chapter 7: Discussion and Management Options

The idea of ecotourism seems to have been the quintessential form of tourism in SVG before use of the term became popular. Mr. James Mitchell, a former Prime Minister of SVG, pursued tourism development policy that would not degrade the islands, recognizing that tourists were interested in participating in a different experience and seeing West Indian culture, and not another 'Miami Beach hotel type resort' (Adams, 1979). The participants of this study were in support of ecotourism being offered in Ashton Lagoon, as it is expected to attract more people to the country and provide more employment opportunities for young people. One participant added that Ashton Lagoon should host as many tourism activities as possible, provided it does not degrade the ecosystem, highlighting the importance of determining the area's carrying capacity for tourism.

7.1. (Eco)tourism and Community Capital

Ecotourism facilities, some sort of protected area network, and an efficient transportation network are important for attracting people to natural areas (Santarém & Paiva, 2015). St. Vincent recently made a large investment in an international airport that opened in 2017, creating the opportunity for an original brand of tourism for the country (Bishop, 2007). However, the accessibility of Union Island was emphasized as a substantial deterrent of potential tourists. Streamlining air services with main tourism generating markets abroad is one of the most compelling needs for Caribbean SIDS (Abeyratne, 1999). Abeyratne (1999) recommended that SIDS foster cooperation in civil aviation as much as possible, including consolidation of national and regional airline services if possible. While streamlining exists between international and regional airlines, the cost and frequency still pose an issue not only to air travel, but sea transport as well.

Lee et al. (2014a) found that ecotourists in South Korea (while culture likely has an influence on these results, it worth noting due to the potential similarities shared by individuals attracted to ecotourism globally) prefer to travel in small groups and prefer domestic travel over international travel, which may reflect ecotourists awareness and support of nearby natural environments. They suggest that if tourism managers want to target environmentally friendly travelers, they should specifically identify the travel preferences of independent and domestic

tourists (Lee et al., 2014a). In 2017, domestic travel spending in SVG generated 17.3% of direct travel and tourism GDP (WTTC, 2018). By increasing the frequency and efficiency of transport systems from St. Vincent and other islands, this number could increase. Increasing domestic and regional tourism could also serve to curtail the strong seasonality of visitors, and decrease carbon emissions per tourist.

Limited freshwater access was also identified as a barrier to tourism growth. The Eastern Caribbean has seen a growth of desalination plants due to competition between local and tourism requirements for potable water, amplified by the tourism peak season coinciding with the dry season (Peters, 2015). Rainfall is much higher on the main islands of St. Vincent and Grenada than in the Grenadines, and residents have noted a change in the predictability of wet and dry seasons. While this unpredictability could serve to benefit Grenadine Islands in the dry season, the unpredictability could be enough to merit alternative options, such as a desalination plant or wastewater reuse. However, centralized wastewater reuse projects are not currently attractive to Eastern Caribbean governments due to the high initial investment costs, and should therefore be promoted in the tourism sector and subsectors (Peters, 2015). It is estimated that if employed for irrigation and toilet flushing, wastewater reuse can meet up to 38% of the needs of major hotels and resorts—this is enhanced when structures are closely clustered (Peters, 2015).

Union Island, like many Caribbean islands, is faced with the challenges of managing solid waste, as described previously. More attention should be given to this issue especially in the effort to increase the tourism sector. Long-term strategies are needed, and investment in strategies such as large-scale composting facilities, efficient recycling facilities, incinerators or green design in addition to landfills can improve international investment, tourism, and economic growth (Kinnaman, 2010).

As one of the participants stated, since tourism is a relatively new sector, locals are still adjusting. The Grenadines were little known and nearly isolated from the outside world until as late as 1965, not ‘discovered’ by tourists until the following decades (Adams, 1979). The tourism-fueled conflicts between Ashton and Clifton that were reported could potentially be diminished as the presence of tourists in Ashton becomes more common.

There is some concern that the protection or zoning of Ashton Lagoon could limit the cultural practices discussed previously. Usage and zoning must be carefully and inclusively planned, because when policies of protected areas fail to address the needs of local people, it can

infuse negative attitudes, thus causing ecotourism as a policy to fail (Das & Chatterjee, 2015). The P3DM exercise highlighted that Unionites have the best knowledge of their resources, and are aware of many solutions to the problems (Phillimore, 2013). If Unionites are to take care of their environment, they must be involved in the process, and feel that it belongs to them and will benefit them in the long run (Phillimore, 2013).

Since Ashton Lagoon is within the UPMCA, it is already nationally recognized as an important ecological area that merited restoration. Protected areas can provide controlled environments for research and education, as well as a reference for monitoring (Keenleyside et al., 2012). The disturbance from the Ashton Marina Project in combination with the completed restoration works make it a suitable location for ecotourism development. While there is some concern for tourism pressure, it can be mitigated by sustainable management and continued restoration works. However, the severe degradation of the marine environment can negatively impact tourism attraction, highlighting the importance of completing restoration efforts, as well as the mitigation of land-based and yacht-based pollutants.

It has been suggested that the outer reefs of Ashton Lagoon, formerly composed of elkhorn coral (*Acropora palmata*), suffered mass die-off during the White Band coral disease epidemic that plagued the Caribbean around 1980 (Goreau & Sammons, 2003). In areas of extreme damage, artificial reefs can be used for aquaculture/marine ranching, biodiversity promotion, mitigation of environmental damage, enhancement of recreational diving and ecotourism, expansion of recreational fishing, and artisanal and commercial fisheries production among other uses, thus bringing benefits to several users (Seaman, 2007). If artificial reefs are to be used for ecological restoration, pre-existing ecosystem conditions must be described, and habitat-limitations must be considered (Seaman, 2007). Furthermore, continued restoration works will form another opportunity for local employment.

Education is a critical component for building local capacity and employing locals—sharing information about the ecotourism industry and providing career guidance could increase support for the tourism sector and stimulate local participation (Shakeela et al., 2011). The new ecotourism infrastructure in Ashton Lagoon could not only provide a location for training sessions and workshops, but also increase local awareness of global environmental issues and the local impacts of climate change. This has the potential to create a positive-feedback loop between ecological understanding and employability in the tourism sector.

Poverty eradication is a primary objective of the GoSVG, emphasizing education and public sector reform to facilitating economic diversification, international competitiveness, and sustainable economic development (SVG-EU, 2003). Young people on Union Island will finish school and there will be no jobs available for them, leaving many people having to create their own jobs (Phillimore, 2013). The objectives of SVG's current development plan to stimulate growth in the tourism sector include developing more authentic products that protect the environment and utilize local inputs, facilitating development by local entrepreneurs, and encouraging viable FDIs (SVG-MFEP, 2013). To maximize benefits and minimize costs of tourism development potential, SIDS must take steps to realize their domestic capabilities (Barrowclough, 2007). Barrowclough (2007) emphasizes that the same amount of effort put into attracting the foreign side must be reflected in developing the domestic side of the tourism equation, and that although FDI can play a complementary and catalytic role, it should not supersede domestic investment. Allport and Epperson (2003) described tourism businesses that are more willing to pay for environmental amenities and services as: smaller businesses with highly educated persons in management that are in direct contact with ecotourism sites, who have contributed to environmental causes, and are fully Caribbean owned. This indicates that small local entrepreneurs can better understand the consequences of site congestion and degradation (Allport & Epperson, 2003).

The tourism sector has been described as one that is highly vulnerable to exogenous shocks such as competitive markets, global challenges, terrorism, climate change, oil prices and pandemics, which can have a severe impact on national economies, especially those highly dependent on tourism (Jackman, 2014; Bishop, 2010). In places where the impacts of climate change are pronounced, this vulnerability could become more severe. Jackman (2014) described the diversification of tourism markets as a long-term solution to offsetting volatility. Tourism products in SIDS do not display any strong comparative advantages over one another, even though competitiveness between SIDS has been found to be increasing (Jackman et al., 2011). This led Jackman et al. (2011) to bring attention to the need for policy makers to upgrade tourism products if the tourism sector is to be sustained. Aggressive marketing strategies at the source markets are constantly required for the Grenadine Islands (SVG-EU, n.d.). The SVG Ministry of Tourism promotes events like regattas and boat racing to strategically curtail the seasonality of visitor arrivals (SVG-EU, n.d.). For Union Island, diversification could mean developing more

land-based tourism activities, or marketing and facilitating year-round tourism to overnight visitors. Although ecotourism activities are expected to diversify economic opportunities, Ashton Lagoon is a small area that does not have the capacity to host large-scale ecotourism products. Mahon et al. (2004) stated that land-based opportunities for earnings through cultural and heritage developments to diversify the tourism sector are under-utilized in the Grenadines. A participant of this study added that the trails around Ashton Lagoon could connect with a trail up Mount Taboi, forming a network that extends beyond the lagoon.

Snorkelling or diving, kayaking, and birding were respectively indicated as the most preferred activities in the ecotourism marketing survey (Appendix D). For these three activities, the majority of respondents indicated that they would prefer the experience to be guided and/or would need to rent equipment, which implies a higher potential income than activities that are independent or do not require rentals. The desire for snorkelling and diving provides support for the decision to introduce coral restoration as a means of improving ecotourism products and delivering education about the process.

Although diversifying beyond the current tourism markets can be beneficial to SIDS in the long term, other sustainable livelihood options should be explored. For example, the development of conch and lobster hatcheries, as well as seaweed mariculture have been recommended as forms of alternative income for fishers while also serving to increase recruitment of juvenile lobster and conch (Goreau & Sammons, 2003). In addition to the potential increase in wildlife, products from these and other industries (e.g. honey, sea moss products) could be provided or sold to tourists, and ecotourists could learn about the sustainability of such industries.

7.2. Further development in Ashton Lagoon

A participant of the study commented that the restoration project is regarded as a hope for advancement—since the marina was a failure, residents are hoping for another project that will provide a lot of work, such as a highly-trafficked tourist site. One of the options that came out of the P3DM exercise in 2013 was to explore the development of an eco-friendly marina that ensures the restoration of reefs, seagrass beds, and beaches, and maintains the integrity of the mangroves (Phillimore, 2013). An alternative option might include the proposal of an ecolodge,

a common type of ecotourism-based infrastructure that can increase employment options in hospitality.

An ecolodge is described as a low-impact, environmentally, socially, and financially sustainable facility that helps protect the surrounding environment, involves and benefits local communities, provides an interpretive and interactive experience, and has between 5 and 75 rooms (cited in Blangy & Mehta, 2006). Ecolodges should be developed with the intent to leave the site better off after development than before, and restoration programs should be planned from the beginning (Blangy & Mehta, 2006). The International Ecolodge Guidelines book was created by TIES to help encourage conscientious approaches to developing ecotourism facilities (Mehta et al., 2002). Ecolodges in Costa Rica have been found to deliver social, economic, and environmental benefits, thus leading to their consideration as successful ecotourism developments (Almeyda et al., 2010a; Almeyda et al., 2010b).

Ecolodges can contribute to positive social change through the promotion of local development, environmental education, and by supporting conservation efforts in their communities (Hunt et al., 2015; Horton, 2009). That said, an issue raised by ecotourism studies internationally in the context of ecolodges, is the intensification of traditional gender roles which sometimes leads to women bearing a “double burden” of cooking and cleaning (Reimer & Walter, 2013). Cultural and gender norms of patriarchal societies where women are positioned as weaker than men, can lead to women being excluded from work as ecotourism guides (Reimer & Walter, 2013). Therefore, it would be critical that any future development in Ashton Lagoon avoid following the approach of the Ashton Marina Project, and be preceded by proper evaluation (i.e. stakeholder assessment, EIA, cost-benefit analysis, and risk assessment).

Although Ashton Lagoon is in the process of being restored, further infrastructure development here has the potential to release pressure from other parts of the island that are more ecologically intact. For instance, Goreau and Sammons (2003) recommended that no further development be permitted in Richmond Bay on the north coast on Union Island since the reefs are in the best condition and the beach is used frequently by locals.

7.3. Merit for an Ashton Lagoon Management Plan

Management plans are critical tools for achieving compatibility between recreational, educational, and scientific activities with the conservation of natural and cultural heritage in

protected areas (Robledano et al., 2018). Ecotourism development could therefore be hindered by the lack of a comprehensive management plan (Robledano et al., 2018). One of the participants of this study highlighted potential conflict between yacht anchorage, kite-surfers, swimmers or snorkellers, and birders, indicating a possible trigger for use-zoning within the area. The ecotourism marketing survey revealed that the most common activity tourists found inappropriate for Ashton Lagoon was for motorized watercrafts. This could cause a conflict since the establishment of the breaches in the causeway create an attractive passage for speedboats moving between Ashton and Clifton since going around Frigate Island adds distance and fuel is costly.

Part of the ALRP involved installing moorings on the western side of Frigate Island to reduce anchor damage to seagrass beds and to raise funds for continued management. The OAS recommended that OECS governments adopt a fee policy and schedule based on central government support, the needs of the management area and the economic contribution from the yachting sector (Global Parks, 2014). However, one participant raised the issue of harassment of yachties from people acting as a harbour master coming to collect fees, and instead suggested that the use of moorings could be donation based, which would negate this practice. Whether by donation or fee, an enforceable management plan and policy could serve to mitigate this issue, including proper signage and contact information at mooring sites. Furthermore, it must be determined who will be organizing and offering ecotourism activities in Ashton Lagoon. Managers can collaborate with groups like the Union Island Nature Adventure Tours Cooperative in developing and managing ecotourism program delivery, or deciding if the site will simply be open to anyone interested in offering tours (i.e. day tours from other islands).

When deliberating further development of an industry, it is important to consider the increasing pressures on these environments and the ‘carrying capacity’ of tourism. In addition to monitoring biophysical elements of Ashton Lagoon, local and international visitor trends should be evaluated in tandem. Funds raised from mooring use for example, could be used to finance regular monitoring and evaluation. This is critical for understanding the changes to the environment and society as a result of restoration and ecotourism development, as well as climate change and natural disasters. In terms of further tourism infrastructure development, coastal setbacks or buffer zones can be employed to protect property, people, and the environment (Sealey et al., 2014). A management plan can also increase the efficiency of

handling external pressures, such as *Sargassum* influxes, natural disasters, and sources of pollution.

While a management plan could be developed for the entirety of the UPIMCA, it may not be possible since Palm Island is a privately managed resort island. Due to the shared challenges and high level of connectivity between the Grenadine Islands, another consideration could be the development of a transboundary Grenadines-specific tourism development plan. A plan like this could focus on marketing ‘the Grenadines’ to benefit both SVG and Grenada, and even go so far as to coordinate international flight packages that arrive in St. Vincent or Grenada and depart from the other. The OAS similarly recommended that the OECS Yachting Committee prepare a marketing strategy to increase yacht visitation throughout the Caribbean region (Global Parks, 2014). Table 8 summarizes the management recommendations discussed in this section.

Table 8. Summary of management recommendations for Ashton Lagoon based on interview responses.

1.	Increase availability, efficiency, and reliability of sea and air transport to the Grenadines
2.	Utilize new international airport in St. Vincent to advertise new routes to the Grenadines and streamline services
3.	Market Ashton Lagoon regionally to attract environmentally-conscious travelers
4.	Promote wastewater reuse in the private sector
5.	Improve waste management policy; provide more receptacles especially around tourism/highly-trafficked areas; promote recycling and composting
6.	Continue restoration efforts and monitoring; explore the feasibility of coral reef restoration
7.	Increase accessibility and practicality of education and motivate youth toward entrepreneurship
8.	Advance land-based cultural, heritage, and ecotourism activities on Union Island to create a network of opportunities
9.	Continue to focus on the development of other sustainable livelihood options in the lagoon that do not depend on the existing tourism sector
10.	Create a management plan for Ashton Lagoon; explore options for creating a transboundary-Grenadines tourism development plan

Chapter 8: Conclusions

Based on the perceptions of Union Island residents, ecotourism and ecological restoration have the potential to form a mutually beneficial relationship in Ashton Lagoon. Ecotourism activities are mostly expected to contribute to restoration efforts through the provision of income, and through behaviour changes resulting from increased education and awareness. The restoration of the lagoon ecosystem not only provides a cleaner and more productive environment that will increase the attractiveness of the tourism product, but also creates an inspiring success story and a learning opportunity for tourists. This relationship can be even further developed by allowing ecotourists to take part in future restoration initiatives.

Many of the challenges to ecotourism development in Ashton Lagoon are caused by the major challenges to all tourism development commonly faced by SIDS. The perceived challenges to development and the concerns of residents were described, as well as subsequent management recommendations to foster ecotourism in Ashton Lagoon while strengthening community capitals and ultimately contributing to sustainable development.

8.1. Future Areas of Research

One of the participants of this study commented on the challenges to tourism development, saying, “We know the problems, we know the solutions, but we’re just not doing them”. Further research could explore the specific political, institutional, and financial limitations to increasing physical capital and connectivity between the Grenadine islands. This can inform the priority of management decisions to implement more efficient and frequent transportation systems, which were identified as a key challenge to tourism development.

If coral restoration is to take place in Ashton Lagoon, it is recommended that the description of its feasibility be updated. Previous models of circulation and bottom composition will no longer be accurate due to the creation of breaches in the main causeway.

It is recommended that the market research survey be distributed again, in person, during tourism high season both at Ashton Lagoon and around Union Island, to enable analysis that is statistically significant and more representative. Further, market research for promoting the Grenadines as a destination on both a domestic and international scale would illuminate next steps in the development of sustainable tourism in the Lesser Antilles.

Finally, Ashton Lagoon could benefit from a similar study being conducted after ecotourism activities are developed and active, which would consider informed opinion rather than prediction. There is limited research on the implications of ecotourism being used as a tool for ecological restoration and vice versa, and expanding this knowledge can benefit other SIDS with conflicting development and conservation goals. Through continued restoration, monitoring and evaluation, Ashton Lagoon can be used as an example and model for sustainable tourism development alongside ecological restoration.

References

- Abeyratne, R.I.R. (1999). Management of the environmental impact of tourism and air transport on small island developing states. *Journal of Air Transport Management*, 5(1), 31-37. doi:10.1016/S0969-6997(98)00034-9
- Adams, J.A. (1979). Union Island, West Indies: An historical and geographical sketch. *Caribbean Studies*, 18(3-4), 5-45.
- Albuquerque, T., Loiola, M., Nunes, J.A.C.C., Reis-Filho, J.A., Sampaio, C.L.S., & Leduc, A.O.H.C. (2015). *In situ* effects of human disturbances on coral reef-fish assemblage structure: Temporary and persisting changes are reflected as a result of intensive tourism. *Marine and Freshwater Research*, 66(1), 23-32. doi:10.1071/MF13185
- Allport, R.C., & Epperson, J.E. (2003). Willingness to pay for environmental preservation by ecotourism-linked businesses: Evidence from the Caribbean Windward Islands. *IDEAS Working Paper Series from RePEc*, 16687. St. Louis, MO: Faculty Series.
- Almeyda Zambrano, A.M., Broadbent, E.N., & Durham, W.H. (2010a). Social and environmental effects of ecotourism in the Osa Peninsula of Costa Rica: the Lapa Rios case. *Journal of Ecotourism*, 9(1), 62-83. doi:10.1080/14724040902953076
- Almeyda Zambrano, A.M., Broadbent, E.N., Wyman, M.S., & Durham, W.H. (2010b). Ecotourism impacts in the Nicoya Peninsula, Costa Rica. *International Journal of Tourism Research*, 12, 803-819. doi:10.1002/jtr.797
- Baker, D.M., Rodríguez-Martínez, R.E., & Fogel, M.L. (2013). Tourism's nitrogen footprint on a Mesoamerican coral reef. *Coral Reefs*, 32(3), 691-699. doi:10.1007/s00338-013-1040-2
- Barrowclough, D. (2007). Foreign investment in tourism and small island developing states. *Tourism Economics*, 13(4), 615-638.
- Beetham, E., Kench, P.S., & Popinet, S. (2017). Future reef growth can mitigate physical impacts of sea-level rise on atoll islands. *Earth's Future*, 5, 1002-1014. doi:10.1002/2017EF000589
- Bishop, M.L. (2010). Tourism as a small-state development strategy: pier pressure in the Eastern Caribbean? *Progress in Development Studies*, 10(2), 99-114. doi:10.1177/146499340901000201
- Blangy, S. & Mehta, H. (2006). Ecotourism and ecological restoration. *Journal for Nature Conservation*, 14(3-4), 233-236. doi:10.1016/j.jnc.2006.05.009
- Braun, Y.A., Dreiling, M.C., Eddy, M.P., & Dominguez, D.M. (2015). Up against the wall: ecotourism, development, and social justice in Costa Rica. *Journal of Global Ethics*, 11(3), 351-365. doi:10.1080/17449626.2015.1100653
- Buckley, M.C., & Crone, E.E. (2008). Negative off-site impacts of ecological restoration: Understanding and addressing the conflict. *Conservation Biology*, 22, 1118-1124. doi:10.1111/j.1523-1739.2008.01027.x
- Carilli, J. (2013). Why are coral reefs important? Retrieved from: https://www.nature.com/scitable/blog/saltwater-science/why_are_coral_reefs_important

- Choi, Y.E., Song, K., Kim, M., & Lee, J. (2017). Transformation planning for resilient wildlife habitats in ecotourism systems. *Sustainability*, 9, 487. doi:10.3390/su9040487
- Churchman, C.W. (1967). Guest editorial: Wicked problems. *Management Science*, 14(4), B141-B142
- Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., ... van den Belt, M. (1997). The value of the world's ecosystem services and natural capital. *Nature*, 387, 253-260.
- Cowburn, B., Moritz, C., Birrell, C., Grimsditch, G., & Abdulla, A. (2018). Can luxury and environmental sustainability co-exist? Assessing the environmental impact of resort tourism on coral reefs in the Maldives. *Ocean and Coastal Management*, 158, 120-127. doi:10.1016/j.ocecoaman.2018.03.025
- Daby, D. (2003). Effects of seagrass bed removal for tourism purposes in a Mauritian bay. *Environmental Pollution*, 125(3), 313-324. doi:10.1016/S0269-7491(03)00125-8
- Das, M., & Chatterjee, B. (2015). Ecotourism: A panacea or predicament? *Tourism Management Perspectives*, 14, 3-16. doi:10.1016/j.tmp.2015.01.002
- DeGraff, A.K. & Baldwin, K. (2013). *Participatory Mapping of Heritage Sites in the Grenadine Islands*. Centre for Resource Management and Environmental Studies, The University of the West Indies, Cave Hill Campus, Barbados. CERMES Technical Report No. 65. 51 pp.
- Dobson, M. & Frid, C. (2009). *Ecology of aquatic systems*. 2nd ed. New York, NY: Oxford University Press.
- Donato, D.C., Kauffman, J.B., Murdiyarso, D., Kurnianto, S., Stidham, M., Kanninen, M. (2011). Mangroves among the most carbon-rich forests in the tropics. *Nature Geoscience*, 4(5):293–297. doi:10.1038/ngeo1123
- Dudley, N. (Editor) (2008). *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: IUCN x + 86pp.
- ECCEA (Eastern Caribbean Coalition for Environmental Awareness). (2018). *ECCEA: Projects*. Retrieved from: <http://www.eccea.com/index.php?page=projects>
- Erfteimeijer, P.L.A., Riegl, B., Hoeksema, B.W., Todd, P.A. (2012). Environmental impacts of dredging and other sediment disturbances on corals: a review. *Marine Pollution Bulletin*, 64(9), 1737–1765. doi:10.1016/j.marpolbul.2012.05.008
- Fabricius, K. (2005). Effects of terrestrial runoff on the ecology of corals and coral reefs: review and synthesis. *Marine Pollution Bulletin*, 50, 125-146. doi:10.1016/j.marpolbul.2004.11.028
- Gil, M.A., Renfro, B., Figueroa-Zavala, B., Penié, I., & Dunton, K.H. (2015). Rapid tourism growth and declining coral reefs in Akumal, Mexico. *Marine Biology*, 162, 2225-2233. doi:10.1007/s00227-015-2748-z
- Goodman, L.A. (1961). Snowball sampling. *The Annals of Mathematical Statistics*, 32(1), 148-170.
- Global Parks. (2014). *Marine protected area fee harmonization study for 6 countries in the Lesser Antilles*. Prepared for The Organization of American States.

- Goreau, T.J., & Sammons, N. (2003). *Water quality in Ashton Harbour, Union Island, St. Vincent & the Grenadines: Environmental impacts of marina and recommendations for ecosystem and fisheries restoration*. Cambridge, MA: Global Coral Reef Alliance.
- Gradinaru, G. (2014). A business perspective of a natural capital restoration. *Procedia Economics and Finance*, 10, 97-103. doi: 10.1016/S2212-5671(14)00282-2
- Hobbs, R.J., & Harris, J.A. (2001). Restoration ecology: Repairing the earth's ecosystems in the new millennium. *Restoration Ecology*, 9(2), 239-246. doi:10.1046/j.1526-100x.2001.009002239.x
- Horton, L.R. (2009). Buying up nature: Economic and social impacts of Costa Rica's ecotourism boom. *Latin American Perspectives*, 36(3), 93-107. doi:10.1177/0094582X09334299
- Humann, P. & DeLoach, N. (2013). *Reef Coral Identification: Florida, Caribbean, Bahamas*. 3rd ed. Jacksonville, FL: New World Publications, Inc.
- Hunt, C.A., Durham, W.H., Driscoll, L., & Honey, M. (2015). Can ecotourism deliver real economic, social, and environmental benefits? A study of the Osa Peninsula, Costa Rica. *Journal of Sustainable Tourism*, 23(3), 339-357. doi:10.1080/09669582.2014.965176
- Jackman, M. (2014). Output volatility and tourism specialization in small island developing states. *Tourism Economics*, 20(3), 527-544. doi:10.5367/te.2013.0289
- Jackman, M., Lorde, T., Lowe, S., & Alleyne, A. (2011). Evaluating tourism competitiveness of small island developing states: a revealed comparative advantage approach. *Anatolia*, 22(3), 350-360. doi:10.1080/13032917.2011.626311
- Keenleyside, K.A., Dudley, N., Cairns, S., Hall, C.M., & Stolton, S. (2012). *Ecological Restoration for Protected Areas: Principles, Guidelines and Best Practices*. Gland, Switzerland: IUCN x + 120pp.
- Kimirei, I.A., Nagelkerken, I., Mgaya, Y.D., & Hujibers, C.M. (2013). The mangrove nursery paradigm revisited: Otolith stable isotopes support nursery-to-reef movements by Indo-Pacific fishes. *PLOS one*, 1932-6203. doi:10.1371/journal.pone.0066320
- Kinnaman, T.C. (2010). Solid waste management in the Caribbean. *Journal of Eastern Caribbean Studies*, 35(2), 38-60.
- Kirkby, C.A., Giudice-Granados, R., Day, B., Turner, K., Velarde-Andrade, L.M., Dueñas-Dueñas, A., ... Yu, D.W. (2010). The market triumph of ecotourism: An economic investigation of the private and social benefits of competing land uses in the Peruvian Amazon. *PLoS ONE*, 5(9), e13015. doi:10.1371/journal.pone.0013015
- Koens, J.F., Dieperink, C., & Miranda, M. (2009). Ecotourism as a development strategy: experiences from Costa Rica. *Environment, Development and Sustainability*, 11, 1225-1237. doi:10.1007/s10668-009-9214-3
- La Manna, G., Donno, Y., Sarà, G., & Ceccherelli, G. (2015). The detrimental consequences for seagrass of ineffective marine park management related to boat anchoring. *Marine Pollution Bulletin*, 90(1-2), 160-166. doi:10.1016/j.marpolbul.2014.11.001

- Lamb, J.B., True, J.D., Piromvaragorn, S., & Willis, B.L. (2014). Scuba diving damage and intensity of tourist activities increases coral disease prevalence. *Biological Conservation*, 178, 88-96. doi:10.1016/j.biocon.2014.06.027
- Lee, S., Lee, S., & Lee, G. (2014a). Ecotourists' motivation and revisit intention: A case study of restored ecological parks in South Korea. *Asia Pacific Journal of Tourism Research*, 19(11), 1327-1344. doi:10.1080/10941665.2013.852117
- Lee, S.Y., Primavera, J.H., Dahdouh-Guebas, F., McKee, K., Bosire, J.O., Cannicci, S., ... Record, S. (2014b). Ecological role and services of tropical mangrove ecosystems: a reassessment. *Global Ecology and Biogeography*, 23, 726-743. doi:10.1111/geb.12155
- Mahon, R., Almerigi, S., McConney, P., Ryan, C., and Whyte, B. (2004). Coastal resources and livelihoods in the Grenadine Islands: Facilitating change in self-organising systems. *Proceedings of the Gulf and Caribbean Fisheries Institute* 55: 56-67.
- Masud, M.M., Aldakhil, A.M., Nassani, A.A., & Azam, M.N. (2017). Community-based ecotourism management for sustainable development of marine protected areas in Malaysia. *Ocean & Coastal Management*, 136, 104-112. doi:10.1016/j.ocecoaman.2016.11.023
- Mehta, H., Baez, A., & O'Loughlin, P. (Eds.). (2002). *International Ecotourism Guidelines*. Burlington, Vermont: The International Ecotourism Society.
- Mills, A.P. (2001). Reports: St. Vincent and the Grenadines. *Marine Pollution Bulletin*, 42(12), 1208-1220.
- Minca, C., & Linda, M. (2000). *Ecotourism on the edge: the case of Corcovado National Park, Costa Rica*. in Xavier Font and John Tribe (eds.), *Forest Tourism and Recreation: Case Studies in Environmental Management*. Oxford, UK: Oxford University Press.
- Mukherjee, N., Sutherland, W.J., Khan, M.N.I., Berger, U., Schmitz, N., Dahdouh-Guebas, F., & Koedam, N. (2014). Using expert knowledge and modeling to define mangrove composition, functioning, and threats and estimate time frame for recovery. *Ecology and Evolution*, 4(11), 2247-2262. doi:10.1002/ece3.1085
- Nagelkerken, I. (2007). Are non-estuarine mangroves connected to coral reefs through fish migration? *Bulletin of Marine Science*, 80(3), 595-607.
- Orth, R.J., Carruthers, T.J.B., Dennison, W.C., Duarte, C.M., Fourqurean, J.W., Heck Jr., K.L., ... Williams, S. (2006). *BioScience*, 56(12), 987-996.
- Pantin, D.A. (1999). The challenge of sustainable development in small island developing states: case study on tourism in the Caribbean. *Natural Resources Forum*, 23, 221-233. doi:10.1111/j.1477-8947.1999.tb00911.x
- Pedrick, C. (2016). *The Power of Maps: Bringing the third dimension to the negotiation table*. Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA).
- Peters, E.J. (2015). Wastewater reuse in the Eastern Caribbean: a case study. *Water Management*, 168(WM5), 232-242. doi:10.1680/wama.14.00059
- Phillimore, J. (2013). *Beneath the Surface – Mapping Union Island* [Video file]. Retrieved from: <http://vimeo.com/channels/pgis/72414917>

- Pinkerton, E., & John, L. (2008). Creating local management legitimacy. *Marine Policy*, 32, 680-691. doi: 10.1016/j.marpol.2007.12.005
- Polidoro, B.A., Carpenter, K.E., Collins, L., Duke, N.C., Ellison, A.M., Ellison, J.C., ... Yong, J.W.H. (2010). The loss of species: mangrove extinction risk and geographic areas of global concern. *PLOS one*, 5(4), e10095. doi:10.1371/journal.pone.0010095
- Price, W.S. & Price, P.G. (1994). Ashton Marina Project: Potential ecological impact on Union Island, St. Vincent and the Grenadines. Requested by the Union Island Association for Ecological Preservation (UIAP).
- Price, W.S. & Price, P.G. (1998). Paradise Lost: A postmortem of the Ashton Marina Project, ecological impact on Ashton Lagoon, Union Island, St. Vincent and the Grenadines. Prepared for the Union Island Association for Ecological Preservation (UIAP).
- Protected Planet. (2018). *Union-Palm Island in St. Vincent and the Grenadines*. Retrieved from: <https://www.protectedplanet.net/union-palm-island-marine-conservation-area>
- Pueyo-Ros, J., Garcia, X., Ribas, A., & Fraguell, R.M. (2018). Ecological restoration of a coastal wetland at a mass tourism destination: Will the recreational value increase or decrease? *Ecological Economics*, 148, 1-14. doi:10.1016/j.ecolecon.2018.02.002
- Ramírez, F. & Fennell, D. (2014). A comprehensive framework for ecotourism and wetland restoration: the case of Bogotá, Colombia. *Journal of Ecotourism*, 13(2-3), 128-151. doi:10.1080/14724049.2015.1011161
- Reimer, J.K., & Walter, P. (2013). How do you know it when you see it? Community-based ecotourism in the Cardamom Mountains of southwest Cambodia. *Tourism Management*, 34, 122-132. doi:10.1016/j.tourman.2012.04.002
- Robledano, F., Esteve, M.A., Calvo, J.F., Martínez-Paz, J.M., Farinós, P., Carreño, M.F., ... Zamora, A. (2018) Multi-criteria assessment of a proposed ecotourism, environmental education and research infrastructure in a unique lagoon ecosystem: The Encañizadas del Mar Menor (Murcia, SE Spain). *Journal for Nature Conservation*, 43, 201-210. doi:10.1016/j.jnc.2017.10.007
- Roseland, M. (2012). *Toward sustainable communities: Solutions for citizens and their governments*. 4th ed. Gabriola Island, BC: New Society Publishers.
- Roudi, S., Arasli, H., & Akadiri, S.S. (2018): New insights into an old issue – examining the influence of tourism on economic growth: evidence from selected small island developing states. *Current Issues in Tourism*, 1-21. doi:10.1080/13683500.2018.1431207
- Rouphael, A.B., & Inglis, G.J. (2001). “Take only photographs and leave only footprints”?: An experimental study of the impacts of underwater photographers on coral reef dive sites. *Biological Conservation*, 100(3), 281-287. doi:10.1016/S0006-3207(01)00032-5
- Samways, M.J., Hitchins, P.M., Bourquin, O., & Henwood, J. (2010). Restoration of a tropical island: Cousine Island, Seychelles. *Biodiversity Conservation*, 19, 425-434. doi:10.1007/s10531-008-9524-z
- Santarém, F., & Paiva, F. (2015). Conserving desert biodiversity through ecotourism. *Tourism Management Perspectives*, 16, 176-178. doi:10.1016/j.tmp.2015.07.016

- Scheyvens, R. (2018). Linking tourism to the sustainable development goals: a geographical perspective. *Tourism Geographies*, 20(2), 341-342. doi:10.1080/14616688.2018.1434818
- Sealey, K.S., McDonough, V.N., & Lunz, K.S. (2014). Coastal impact rankings of small islands for conservation, restoration and tourism development: A case study of The Bahamas. *Ocean & Coastal Management*, 91, 88-101. doi:10.1016/j.ocecoaman.2014.01.010
- Seaman, W. (2007). Artificial habitats and the restoration of degraded marine ecosystems and fisheries. *Hydrobiologia*, 580, 143-155. doi:10.1007/s10750-006-0457-9
- SER (The Society for Ecological Restoration International Science and Policy Working Group). (2004). *The SER International Primer on Ecological Restoration*. www.ser.org & Tucson: Society for Ecological Restoration International. 15pp.
- SFU (Simon Fraser University). (2012). *CC scan*. Retrieved from: www.ccscan-ca.cscd.sfu.ca
- Shakeela, A., Ruhanen, L., & Breakey, N. (2011). The role of employment in the sustainable development paradigm—The local tourism labor market in small island developing states. *Journal of Human Resources in Hospitality & Tourism*, 10(4), 331-353. doi:10.1080/15332845.2011.588493
- Short, F.T., Koch, E., Creed, J.C., Magalhaes, K.M., Fernandez, E., & Gaeckle, J.L., (2006). SeagrassNet monitoring across the Americas: case studies of seagrass decline. *Marine Ecology*, 27(4), 277-289. doi:10.1111/j.1439-0485.2006.00095.x
- Short, F., Carruthers, T., Dennison, W., & Waycott, M. (2007). Global seagrass distribution and diversity: A bioregional model. *Journal of Experimental Marine Biology and Ecology*, 350(1-2), 3-20. doi:10.1016/j.jembe.2007.06.012
- Sirilersuang, P., & Pongkijvorasin, S. (2018). Dynamic optimal joint policies for tourism promotion and environmental restoration. *Society for Environmental Economics and Policy Studies*, 20, 261-286. doi:10.1007/s10018-017-0193-6
- Slaper, T.F., & Hall, T.J. (2011). The Triple Bottom Line: What is it and how does it work? *Indiana Business Review*, 86(1), 4-8.
- Sorenson, L.G. (2008). Participatory Planning Workshop for the Restoration of Ashton Lagoon: Workshop Proceedings and Final Report. The Society for the Conservation and Study of Caribbean Birds and Sustainable Grenadines Project. 99p.
- Spalding, M. Burke, L., Wood, S.A., Ashpole, J., Hutchison, J., & zu Ermgassen, P. (2017). Mapping the global value and distribution of coral reef tourism. *Marine Policy*, 82, 104-113. doi:10.1016/j.marpol.2017.05.014
- Sustainable Grenadines Inc. (2016). Full Application Form: Restoring Ashton Lagoon's Ecosystem to Promote Nature Based Adaptation to Climate Change while Creating Sustainable Livelihoods Opportunities for the people of Union Island. Prepared for: Caribbean Community Climate Change Centre (CCCCC).
- SVG-DMA (St. Vincent and the Grenadines Department of Maritime Administration). (2013). *St. Vincent and the Grenadines Development of a National Ocean Policy: Discussion Document*. Retrieved from: <http://security.gov.vc/security/index.php/national-ocean-policy-discussion>

- SVG-EU (St. Vincent and the Grenadines Energy Unit). (n.d.). *Marine Tourism Policy*. Retrieved from: <http://energyunit.gov.vc/energyunit/index.php/projects/acts-bills>. 15 pp.
- SVG-EU (St. Vincent and the Grenadines Energy Unit). (2003). *National Tourism Policy*. Retrieved from: <http://energyunit.gov.vc/energyunit/index.php/projects/acts-bills>
- SVG-MFEP (St. Vincent and the Grenadines Ministry of Finance and Economic Planning). (2013). *St. Vincent and the Grenadines National Economic and Social Development Plan 2013-2025*. Retrieved from: <https://sustainabledevelopment.un.org/content/documents/1466vincentgrenadines.pdf>
- SVG-MHWE (St. Vincent and the Grenadines Ministry of Health, Wellness, and the Environment). (2013). *National Report St. Vincent and the Grenadines: Third International Conference on Small Island Developing States – National Report*. Retrieved from: <https://sustainabledevelopment.un.org/content/documents/1134247SVG%20Rio+20%20Final%20Report.pdf>
- SVG-NPRBA (St. Vincent and the Grenadines National Parks, Rivers and Beaches Authority). (n.d.). *Protected Areas*. Retrieved from: <http://nationalparks.gov.vc/nationalparks/index.php/conservation/protected-areas>
- SVG-TA (St. Vincent and the Grenadines Tourism Authority). (2009). *Union Island*. Retrieved from: <http://www.discoversvg.com/index.php/en/union-island/explore>
- Teelucksingh, S.S., & Watson, P.K. (2013). Linking tourism flows and biological biodiversity in Small Island Developing States (SIDS): evidence from panel data. *Environment and Development Economics*, 18(4), 392-404.
- TIES (The International Ecotourism Society). (2018). *What is Ecotourism?* Retrieved from: <https://www.ecotourism.org/what-is-ecotourism>
- UNEP-WCMC (UN Environment World Conservation Monitoring Centre). (2018). *Protected area profile for Saint Vincent and the Grenadines from the World Database of Protected Areas*. Retrieved from: <https://www.protectedplanet.net/country/VC>
- UNWTO (United Nations World Tourism Organization). (n.d.). *Tourism and Small Island Developing States*. Retrieved from: <http://sdt.unwto.org/content/tourism-and-small-islands-developing-states-sids>
- UNWTO (United Nations World Tourism Organization). (2014). *Tourism in Small Island Developing States*. Madrid, Spain: UNWTO. 6pp.
- Wang, Y., Yao, Y., & Ju, M. (2008). Wise use of wetlands: Current state of protection and utilization of Chinese wetlands and recommendations for improvement. *Environmental Management*, 41(6), 793-808. doi:10.1007/s00267-008-9072-z
- Waycott, M., Duarte, C.M., Carruthers, T.J.B., Orth, R.J., Dennison, W.C., Olyarnik, S., ... Williams, S.L. (2009). Accelerating loss of seagrasses across the globe threatens coastal ecosystems. *Proceedings of the National Academy of Science*, 106(30), 12377-12381. doi:10.1073/pnas.0905620106

- Whelan, C. (2013). *Spotlight on Sustainability: Why is Tourism Special?* Retrieved from: <https://www.worldwildlife.org/blogs/good-nature-travel/posts/spotlight-on-sustainability-why-is-ecotourism-special>
- Williamson, J.E., Byrnes, E.E., Clark, J.A., Connolly, D.M., Schiller, S.E., Thompson, J.A., ... Raoult, V. (2017). Ecological impacts and management implications of reef walking on a tropical reef flat community. *Marine Pollution Bulletin*, 114, 742-750. doi:10.1016/j.marpolbul.2016.10.069
- WTO-UNDP (World Tourism Organization and United Nations Development Programme). (2017). *Tourism and the Sustainable Development Goals – Journey to 2030, Highlights*. UNWTO, Madrid.
- WTTC (World Travel & Tourism Council). (2018). *Economic Impact 2018: St. Vincent and the Grenadines*. WTTC, London UK.
- World Wildlife Fund (WWF). (2017a). Coral reefs: importance. Retrieved from: http://wwf.panda.org/about_our_earth/blue_planet/coasts/coral_reefs/coral_importance/
- World Wildlife Fund (WWF). (2017b). Mangrove forests: ecology. Retrieved from: http://wwf.panda.org/about_our_earth/blue_planet/coasts/mangroves/mangrove_ecology/

Appendix A

Semi-structured Interview Guide

- **Hand the participant the consent form and ensure that they do not have any questions regarding the research project or form**
- **Have participant sign the signature page**

Questions:

Demographic

- a) Can you tell me a little bit about yourself?
- b) How long have you been living on Union Island?
- c) So as you know, I'm interviewing various users of Ashton Lagoon. Can you tell me: how do you currently, or how do you plan to use the Lagoon area?

Part 1

- a) I mentioned that this interview would be related to ecological restoration. Can you explain to me what you think ecological restoration is or should be?
- b) Can you tell me what you know about the Ashton Lagoon Restoration Project?
- c) Are you familiar with the term ecotourism?
- d) **[If so]** How do you think ecotourism is different from other forms of tourism?
[Explain what ecotourism is, and how it is being implemented on the island]
So, there are 4 main characteristics that set ecotourism apart from other types of tourism:
 - **It involves responsible travel to natural areas**
 - **It should contribute to conservation of the environment**
 - **It should promote the welfare of local people**
 - **And there should be some aspect of education and interpretation****Part of the Ashton Lagoon restoration project involves developing a set of ecotourism products to be offered by local guides once the restoration works are complete and the Interpretive Centre is built.**
- e) Generally, how do you feel about the development of ecotourism activities in Ashton Lagoon?
- f) Do you think certain types of tourism or ecotourism are more appropriate for Ashton Lagoon than others? Why?

Part 2

Natural

- a) Do you think Ashton Lagoon should be protected? Partly or fully (i.e. no tourism)?
- b) How would you describe the state of the natural environment and marine life in Ashton Lagoon or more generally around Union Island?
 - Do you think ecotourism development will have an effect on these systems? How?
- c) Do you think that the development of ecotourism might affect how local people and tourists treat the natural environment?

Economic

- a) How would you describe the global reach of Union Island as a tourist destination?
- b) Can you name any advantages or disadvantages that the location of Union Island might have on ecotourism development?

- c) Do you think there is a demand for ecotourism activities among tourists?
- d) Do you think ecotourism could provide sufficient and reliable income for local people?

Human

- a) Do you think that there is sufficient access to education and training for those who want to work in ecotourism?
- b) Do you think ecotourism could play a role in educating residents about the natural environment?

Physical

- a) Is fresh water accessible for most people on Union Island year-round?
 - Do you think this could have an effect on tourism developments?
 - Alternatively, do you think tourism development could affect water availability?
- b) Do you think tourism affects the amount of land or water available for other uses?
- c) How would you describe waste management on Union Island?
 - Do you think this has an effect on tourism developments?
 - Alternatively, do you think tourism development could affect waste and waste management?
- d) Can you talk a bit about transportation to and around Union Island?
 - How might this affect tourism developments?
 - Alternatively, do you think tourism development could have an effect on transportation systems?
- e) How would you describe access to goods on Union Island?
 - Do you think this has an effect on those looking to develop independent ecotourism businesses?

Social

- a) Have you observed any common attitudes toward climate change and the environment on Union Island?
- b) How would you describe common attitudes towards tourism on the island?
- c) Do you think that there are strong social connections on the island?
 - Do you think tourism has an effect on that?
- d) Do you know of much violence or crime on the island and surrounding waters?
 - What, if any, is the relationship with tourism and tourists?

Cultural

- a) Would you say there is a strong presence of cultural tradition on Union Island?
- b) Do you think that local culture and tradition has been affected by tourism at all? **[If so]**
How?
- c) Do you think ecotourism in Ashton Lagoon would affect local culture in any way?

Is there anything else you'd like to add that you think might be relevant?

- **Can participant recommend any other potential participants?**
- **Remove signature page and allow participant to keep Consent Form**

Appendix B

Marine Affairs Program
DALHOUSIE UNIVERSITY

Marine Affairs Program Ethics Review Standing Committee Letter of Approval

August 2, 2018

Dear Helena,

MAPERSC #: MAP2018-07

Project Title: Ecotourism and ecological restoration on small island developing states

Effective date: August 2, 2018

Expiry date: August 2, 2019

The Marine Affairs Program Ethics Review Standing Committee has reviewed your application for research involving humans and found the proposed research to be in accordance with the Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans. This approval will be in effect until the date indicated above. This approval is subject to the conditions listed below which constitute your on-going responsibilities with respect to the ethical conduct of this research.

Sincerely,



Claudio Aporta, Chair

Post MAPERSC Approval: On-going Responsibilities of Researchers

After receiving ethical approval for the conduct of research involving humans, there are several ongoing responsibilities that researchers must meet to remain in compliance with University and Tri-Council policies.

1. Additional Research Ethics approval

Prior to conducting any research, researchers must ensure that all required research ethics approvals are secured (in addition to this one). This includes, but is not limited to, securing appropriate research ethics approvals from: other institutions with whom the PI is affiliated; the research institutions of research team members; the institution at which participants may be recruited or from which data may be collected.

2. Reporting adverse events

Any significant adverse events experienced by research participants must be reported in writing to Marine Affairs Program Ethics Review Standing Committee within 24 hours of their occurrence. Examples of what might be considered “significant” include: an emotional breakdown of a participant during an interview, a negative physical reaction by a participant (e.g. fainting, nausea, unexpected pain, allergic reaction), report by a participant of some sort of negative repercussion from their participation (e.g. reaction of spouse or employer) or complaint by a participant with respect to their participation. The above list is indicative but not all-inclusive. The written report must include details of the adverse event and actions taken by the researcher in response to the incident.

3. Seeking approval for protocol / consent form changes

Prior to implementing any changes to your research plan, whether to the protocol or consent form, researchers must submit a description of the proposed changes to the Marine Affairs Program Ethics Review Standing Committee for review and approval.

4. Submitting final reports

When the researcher is confident that no further data collection or participant contact will be required, a Final Report (template attached) must be submitted to Marine Affairs Program Ethics Review Standing Committee. After review and approval of the Final Report, the ethics file will be closed.

5. Retaining records in a secure manner

According to the application, researchers must ensure that both during and after the research project, data is securely retained and/or disposed of in such a manner as to comply with confidentiality provisions specified in the protocol and consent forms. This may involve destruction of the data, or continued arrangements for secure storage. Casual storage of old data is not acceptable.

It is the Principal Investigator’s responsibility to keep a copy of the MAPERSC approval letters. This can be important to demonstrate that research was undertaken with Board approval.

Please note that the Marine Affairs Program Ethics Review Standing Committee will securely store your project file for 5 years after the study closure date at which point the file records may be permanently destroyed.

6. Current contact information and university affiliation

The Principal Investigator must inform the Marine Affairs Program Ethics Review Standing Committee of any changes to contact information for the PI (and supervisor, if appropriate), especially the electronic mail address, for the duration of the MAPERSC approval. The PI must inform Marine Affairs Program Ethics Review Standing Committee if there is a termination or interruption of his or her affiliation with Dalhousie University.

7. Legal Counsel

The Principal Investigator agrees to comply with all legislative and regulatory requirements that apply to the project. The Principal Investigator agrees to notify the University Legal Counsel office in the event that he or she receives a notice of non-compliance, complaint or other proceeding relating to such requirements.

8. Supervision of students

Faculty must ensure that students conducting research under their supervision are aware of their responsibilities as described above, and have adequate support to conduct their research in a safe and ethical manner.

Appendix C

Ashton Lagoon Ecotourism Development Survey (adapted from Google Forms)

BACKGROUND INFORMATION

In the early 90s, the failed development of a marina, hotel, and golf course in Ashton Lagoon led to significant ecological and socioeconomic impacts, with short- and long-term consequences for the community of Ashton. Critical habitat including coral reefs, mangroves, mudflats and seagrass beds came under severe threat, and the water in the lagoon became stagnant and muddy because of the blockage of water circulation.

SusGren and partner organizations are working to restore the ecosystem at Ashton Lagoon, improve coastal resilience to climate change, and increase the diversification of livelihood opportunities by developing sustainable tourism options. An interpretive centre will be available for tourists and locals to learn about the local threats of climate change and the importance of Ashton Lagoon. The centre will also be the headquarters for nature-based guided tours and rentals. It is important for the future of Ashton Lagoon to determine the demand for different tourism activities, so that funds and developments can be prioritized appropriately.

SURVEY

What is your primary country of citizenship?

Do you reside in any other country?

No Yes If Yes, what other country?

What is your age? _____

How many times have you been to Union Island? _____ times

How many days do you usually spend at Union Island when you visit? _____ days

Where do you stay when you visit?

- | | |
|--|--|
| <input type="checkbox"/> Personal Yacht/ Sailboat | <input type="checkbox"/> Rented Yacht/ Sailboat |
| <input type="checkbox"/> Hotel | <input type="checkbox"/> Apartment |
| <input type="checkbox"/> Family/ Friends Residence | <input type="checkbox"/> Other (Please specify): |

Which of the following activities would you like to be available in Ashton Lagoon?

	Not Interested	Somewhat Interested	Interested	Very Interested
Kayaking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stand-up paddle boarding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Birding with Interpretive Guide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walking Trails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snorkelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What other activities (not on the list above) would you like to be available at Ashton Lagoon? (List as many as you can think of).

If you could only pick one activity to be offered in Ashton Lagoon, what would it be?

How would you prefer to experience the activity? (Check the appropriate box)

- Guided / instructed
- Independent

Do you have your own equipment?

- Yes
- No, I would need to rent
- Not Applicable

Is there anything else you would need to enjoy this activity?

What is the most you would be willing to pay for this experience (USD)?

Are there any activities that you think are inappropriate for Ashton Lagoon?

No Yes If Yes, What activities are inappropriate and Why?

Is there anything else you would like to share about your opinion on the activities and use in Ashton Lagoon?

Thank you for taking the time to complete this survey.
If you have any questions, or would like more information on the Ashton Lagoon Restoration Project, you can contact SusGren at:

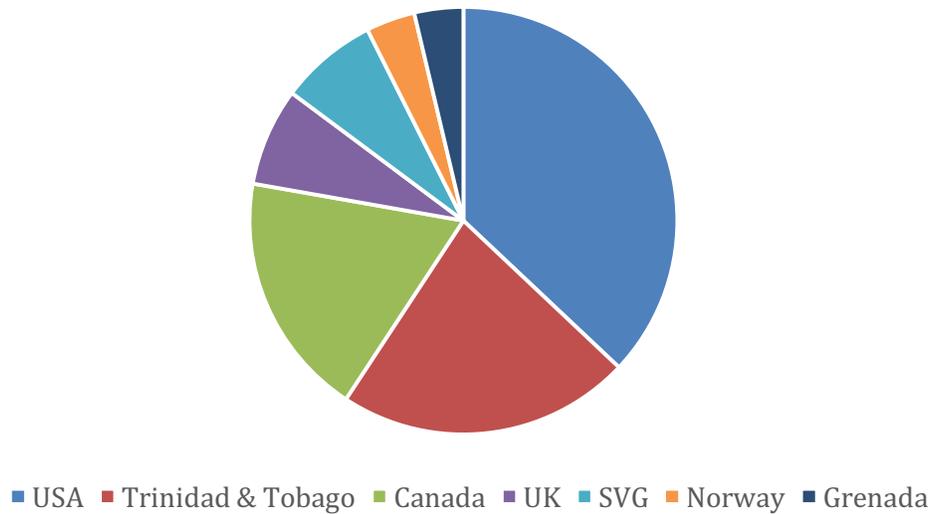
Phone: +1(784) 485-8779 **E-mail:** susgreninc@gmail.com

Appendix D

Ashton Lagoon Ecotourism Survey Results

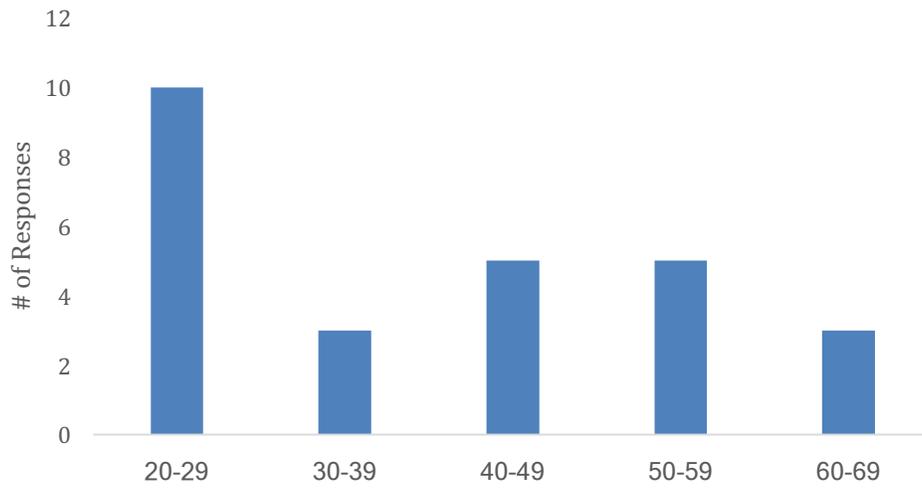
This survey was made available online from July 17th, 2018, and remained active until the end of August 2018. The survey was shared on SusGren’s social media, and subsequently shared by other Grenadines-based organizations and businesses, as well as individuals. Past, current, and anticipated tourists were targeted as the intended respondents for the survey. A total of 29 participants completed the survey. It is recommended that the survey be redistributed on land during the tourism peak season for more conclusive and statistically significant results from a greater range of tourist types.

1. Primary citizenship of participants:

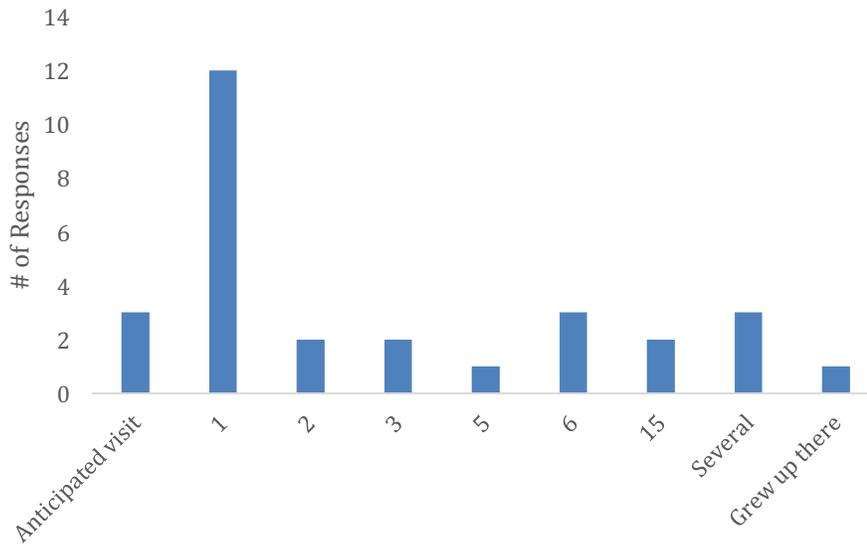


Some participants resided in Grenada, Panama, France, Barbados, St. Vincent & the Grenadines, and Trinidad & Tobago.

2. Age distribution of participants:

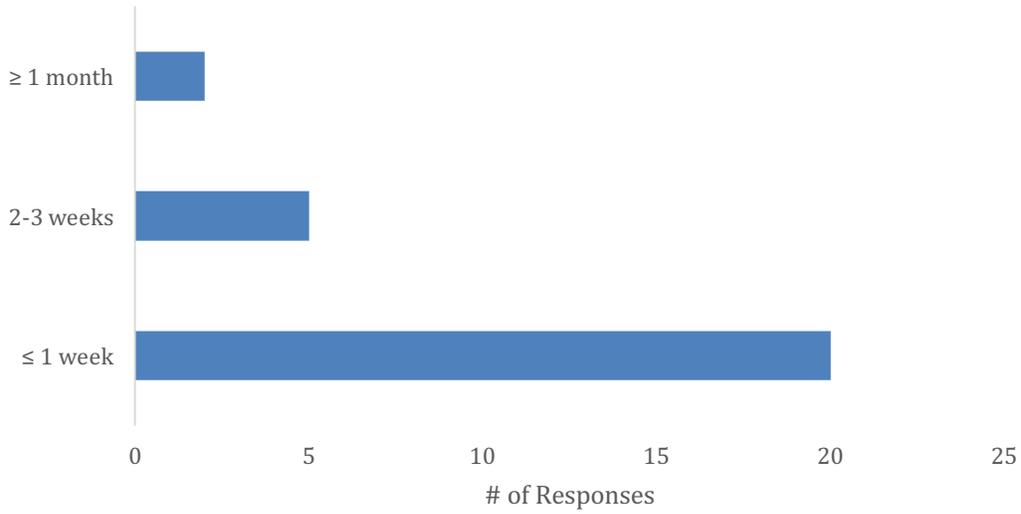


3. Number of times participants have travelled to Union Island:



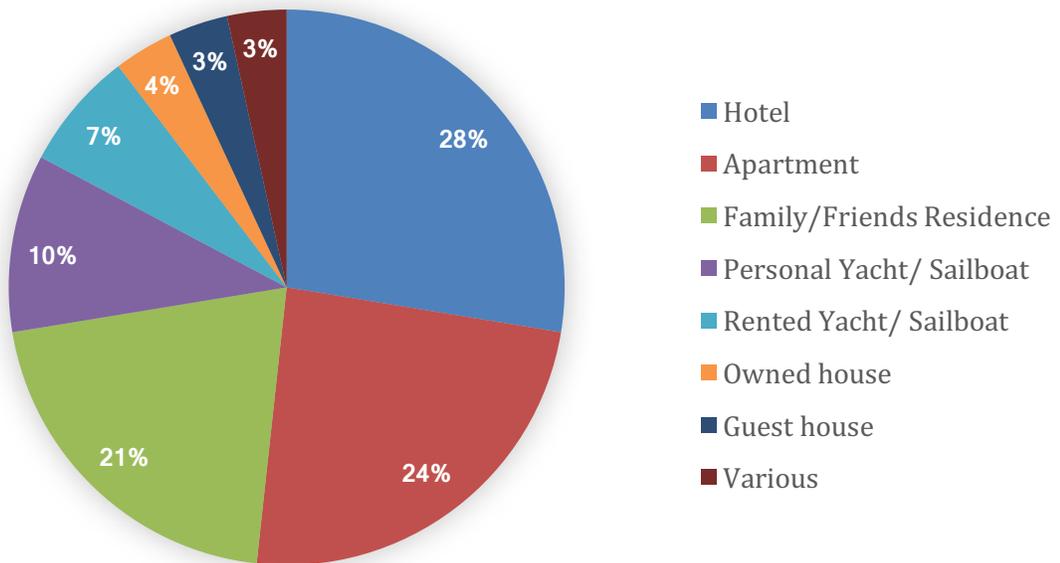
Twelve participants have only been to Union Island once. Fourteen participants have visited more than once. Three participants had not yet been to Union Island, but are planning on visiting.

4. Amount of time normally spent on Union Island per trip:

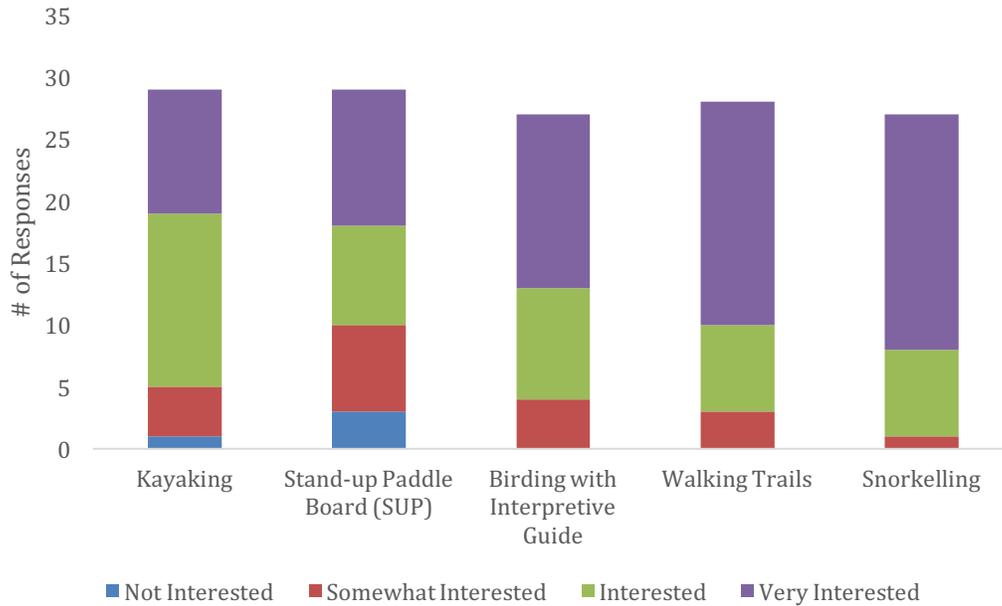


Participants typically spend a week or less on Union Island.

5. Types of accommodation used by participants:



6. Preference for activities in Ashton Lagoon:

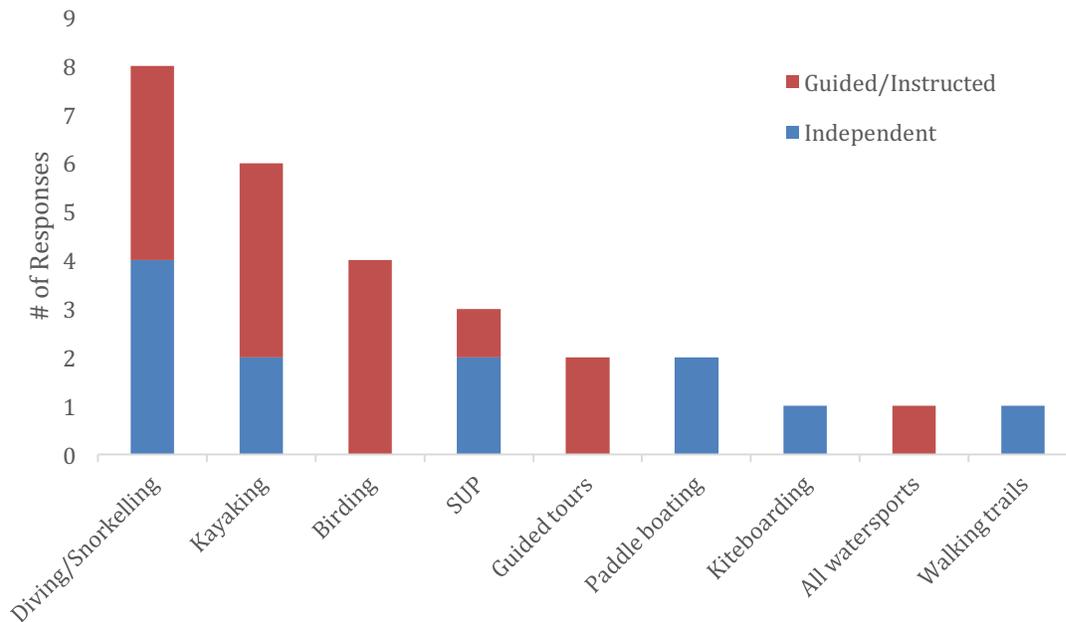


Most participants were either ‘Very Interested’ or ‘Interested’ in the five activities listed. Participants are most interested in snorkelling, and least interested in Stand-up paddle boarding (SUP).

The most common activities suggested in addition the ones listed above are:

- Paddle boating
- Kitesurfing
- Canoeing
- Beach area/swimming
- Scuba diving

7. Most preferred activities, and mode of delivery:



*It should be noted that birding can often be combined with other interpretive guided tours, in which case, the interest would be on par with kayaking.

Almost 70% of participants indicated that they would need to rent equipment for their preferred activity.

On average, people were willing to pay the most for kayaking (\$52 USD average), followed by snorkelling (\$49 USD average), SUP (\$40 USD average), and bird watching (\$26 average).

Most common suggestions to improve the offered activities:

- Meal / Refreshments / Local food
- Restroom / Changing facility and running water
- Map or guide of the area / good snorkel spots

Other suggestions:

- Birding equipment: Binoculars, field guides, bug spray, hat, sunscreen, blind for bird photography
- Life jackets
- Garbage receptacles
- Zoned areas
- Parking

8. Inappropriate activities for Ashton Lagoon:

70% of participants believe certain activities are inappropriate for Ashton Lagoon. The most commonly listed activities are as follows:

- Motor boats and jet skis (9 responses)
- Physical and/or noise pollution (4 responses)

- Fishing (3 responses)
- Snorkelling (except in designated areas) (2 responses)
- Bar / sale of alcohol (2 responses)

9. Other comments and suggestions:

- Keep the area as natural and safe as possible; open to nonintrusive activities
- Use for education site for young locals
- A small refreshment stand / bar
- If entry costs are collected, they should not act to exclude many locals from using the space
- Limit development and construction once restoration is complete
- Involvement of locals for co-management of the area
- Rental facility with a covered area, landscaping, benches, gazebo
- Zoned areas for kiteboarding and snorkelling
- Information along the trails about the natural environment